R85 Rotary Disc 13 Foot Self-Propelled Windrower Header

OPERATOR'S MANUAL

Revision B

Part #169455 $15

R85 ROTARY DISC 13 FOOT SELF-PROPELLED WINDROWER HEADER

1 INTRODUCTION

This instructional manual describes the operating and maintenance procedures for the MacDon Model R85 Self-Propelled 13 foot Rotary Disc Header.

Your new MacDon Rotary Header is designed to cut, condition, and lay in windrows a wide variety of grasses and hay crops.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given in this manual, your Mower will work well for many years. A Parts Catalog is also supplied with your new header. If you require more detailed service information, a Service Manual is available from your dealer.

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized.

Keep this manual handy for frequent reference, and to pass on to new Operators or Owners. Call your Dealer if you need assistance, information, or additional copies of this manual.

Store this Operator's Manual and the Parts Catalog in the manual storage case located at the right end of the header.

RECORD THE SERIAL NUMBER OF THE HEADER.

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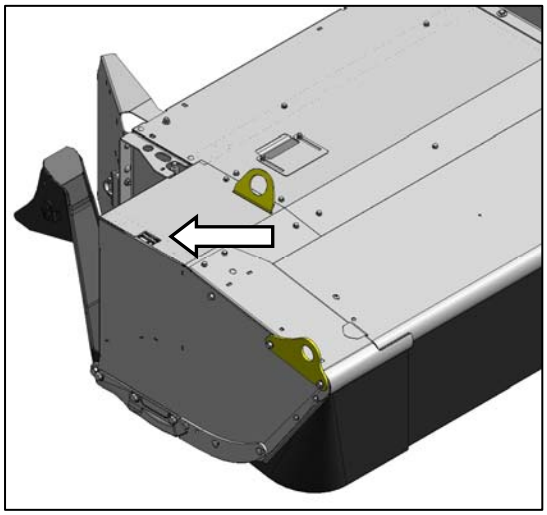
Serial Number plate is located on the top surface at the right end of the header.



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2 SAFETY

2.1 SAFETY ALERT SYMBOL

This safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

Carefully read and follow the safety message accompanying this symbol.

WHY IS SAFETY IMPORTANT TO YOU?

ACCIDENTS DISABLE AND KILL.
ACCIDENTS COST.
ACCIDENTS CAN BE AVOIDED.

2.2 SIGNAL WORDS

Note the use of the signal words **DANGER, WARNING,** and **CAUTION** with safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It is also used to alert against unsafe practices.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.

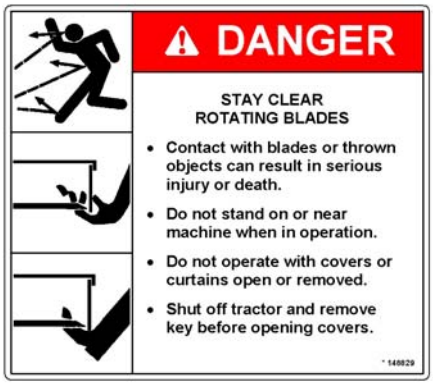
2.3 SAFETY SIGNS

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your Dealer Parts Department.

2.3.1 Safety Sign Installation

a. Be sure the installation area is clean and dry.
b. Decide on the exact location before you remove the decal backing paper.
c. Remove the smaller portion of the split backing paper.
d. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
e. Small air pockets can be smoothed out or pricked with a pin.

2.3.2 Safety Sign Location


DANGER
STAY CLEAR
ROTATING BLADES
• Contact with blades or thrown objects can result in serious injury or death.
• Do not stand on or near machine when in operation.
• Do not operate with covers or curtains open or removed.
• Shut off tractor and remove key before opening covers.

2 PLCS #148829

CAUTION
To avoid injury or death from improper or unsafe machine operation:
1. Read the Operator's Manual, and follow all safety instructions. If you do not have a manual, obtain one from your dealer.
2. Do not allow untrained persons to operate the machine.
3. Review safety instructions with all operators annually.
4. Ensure that all safety signs are installed and legible.
5. Make certain everyone is clear of machine before starting engine and during operation.
6. Keep riders off the machine.
7. Keep all shields in place, and stay clear of moving parts.
8. Disengage header drive, put transmission in neutral and wait for all movement to stop before leaving operator's position.
9. Shut off engine and remove key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
10. Engage locks to prevent lowering of header or reel before servicing in the raised position.
11. Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

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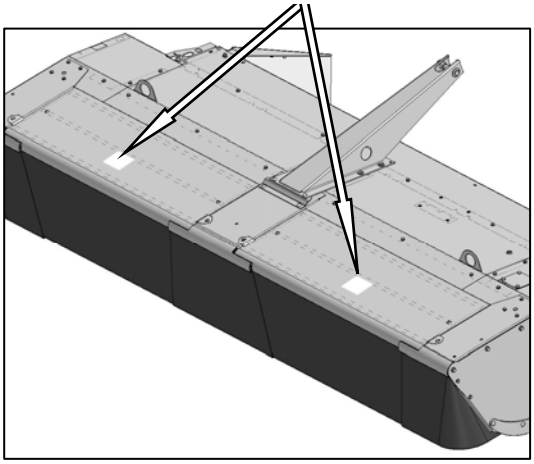

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WARNING
DO NOT GO NEAR LEAKS
• High pressure oil easily punctures skin causing serious injury, gangrene or death.
• If injured, seek emergency medical help - Immediate surgery is required to remove oil.
• Do not use finger or skin to check for leaks
• Lower load or relieve hydraulic pressure before loosening fittings.

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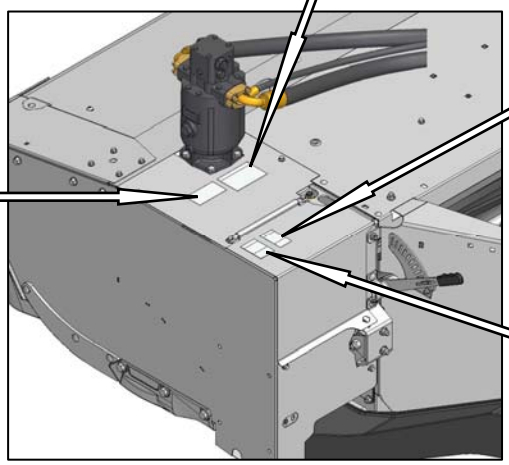
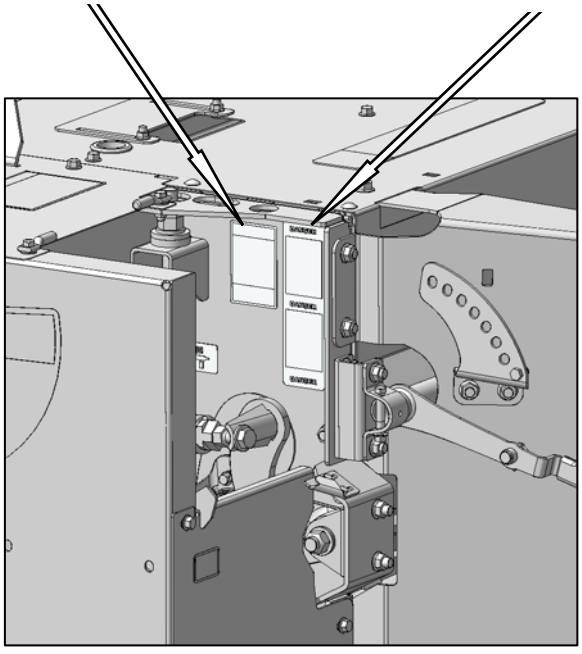


DANGER
ROTATING DRIVELINE
• Stop engine and remove key before opening shield.
• Keep all shields and guards serviced and in place.
Failure to comply will result in death or serious injury.

#170B

1 PLC - BOTH SIDES
#142909

1 PLC #36651

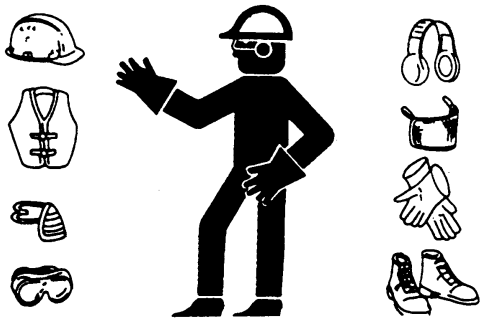


2.4 GENERAL SAFETY

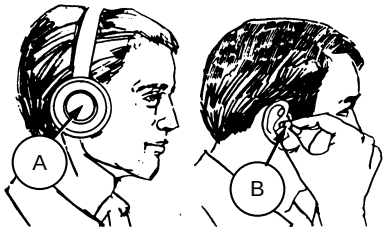
CAUTION

The following are general farm safety precautions that should be part of your operating procedure for all types of machinery:

- **Protect yourself.**
- **When assembling, operating and servicing machinery, wear all the protective clothing and personal safety devices that COULD be necessary for the job at hand. Don't take chances.**
- **You may need:**



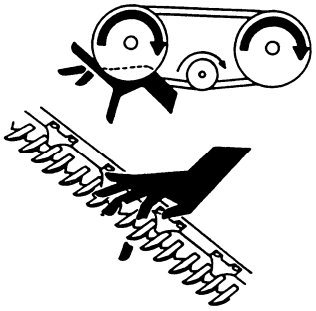
  - **a hard hat.**
  - **protective shoes with slip resistant soles.**
  - **protective glasses or goggles.**
  - **heavy gloves.**
  - **wet weather gear.**
  - **respirator or filter mask.**



  - **hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or ear plugs (B) protects against objectionable or loud noises.**

- **Provide a first-aid kit for use in case of emergencies.**
- **Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.**
- **Keep young children away from machinery at all times.**
- **Be aware that accidents often happen when the operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.**

- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**



- **Keep hands, feet, clothing and hair away from moving parts. Never attempt to clear obstructions or objects from a machine while the engine is running.**
- **Keep all shields in place. Never alter or remove safety equipment. Make sure driveline guards can rotate independently of the shaft and can telescope freely.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**

(continued next page)

- **Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.**

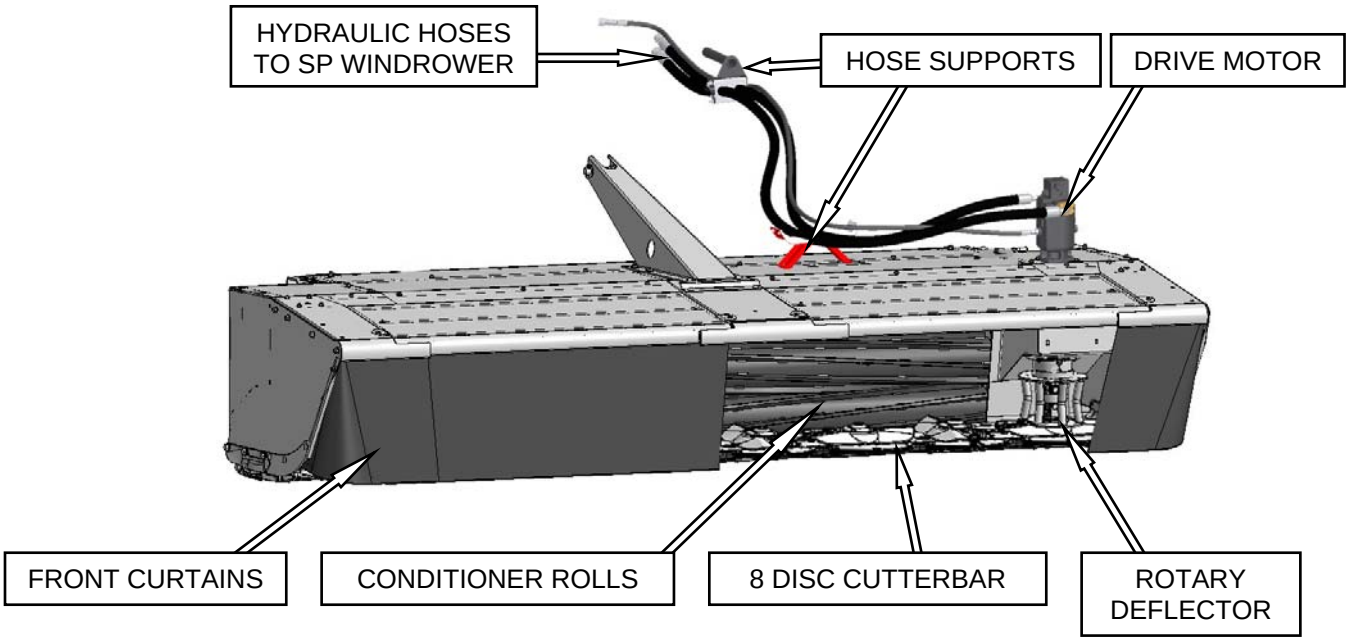
- **Keep the area used for servicing machinery clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Keep machinery clean. Do not allow oil or grease to accumulate on service platforms, ladders or controls. Clean machines before storage.**
- **Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**
- **When storing machinery, cover sharp or extending components to prevent injury from accidental contact.**

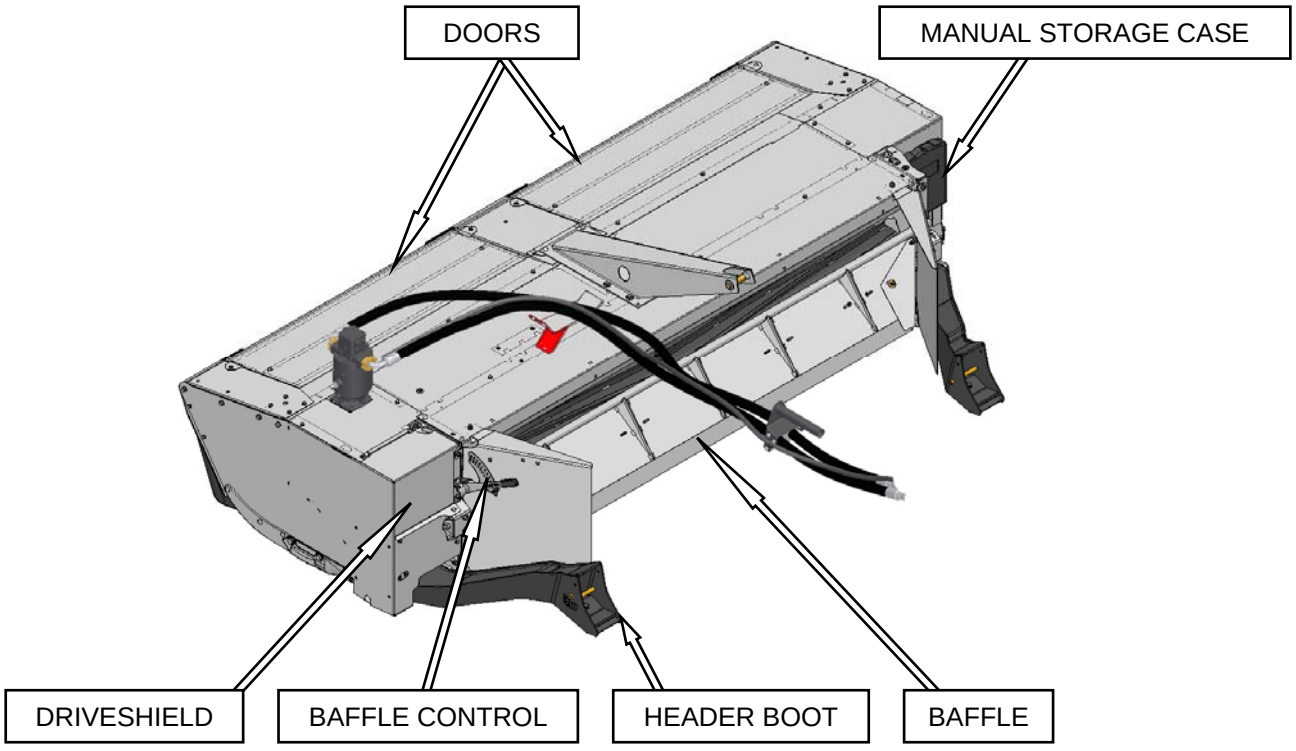
3 DEFINITIONS

The following terms may be used in this manual:

TERM	DEFINITION
API	American Petroleum Institute
ASTM	American Society Of Testing And Materials
Cab-Forward	Windrower operation with the operator and cab facing in the direction of travel.
Center-link	A hydraulic cylinder or turnbuckle type link between the header and the machine that tilts the header.
Engine-Forward	Windrower operation with the operator and engine facing in the direction of travel.
Header or Rotary Header	A machine that cuts and conditions hay, and is attached to a windrower.
Mower Conditioner	A machine that cuts and conditions hay, and is pulled by an agricultural tractor.
rpm	Revolutions Per Minute
SAE	Society Of Automotive Engineers
Self-Propelled Windrower	Self-propelled machine consisting of a power unit with a header and conditioner.
Sickle or Knife	A cutting device which uses a reciprocating cutter.
Tractor	Ag type tractor.
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lb (3400 kg).
Windrower	Power unit of a self-propelled auger header.

4 COMPONENT IDENTIFICATION





5 SPECIFICATIONS

HEADER MODEL		R85 - 13 FT
FRAME AND STRUCTURE		
Transport Width		13 ft-0 in. (3952 mm)
Weight (estimated)		3000 lb (1360 kg)
Carrier		MacDon M150, M200, M205 SP Windrowers
Lighting		None
Manual Storage		Header Mounted Storage Case
CUTTERBAR		
Quantity Of Cutting Discs		8
Blades Per Disc		Two 18 Degrees Bevel Down Reversible
Disc Speed		1800 - 2600 rpm
Blade Tip Speed Range		131 - 189 mph (59.2 - 85.5 m/s)
Effective Cutting Width		12 ft-9.5 in. (3895 mm)
Cutting Height		1 to 3 in. (25 - 75 mm)
Lubricant Capacity (Maximum)		3.37 quarts US (3.25 liters)
Cutting Angle Range		0 - 8 Degrees Below Horizontal
Geartrain Protection		Shearable Disc Spindles
Deflectors		Two Rotary Converging Cages
Shoes		Two Adjustable
DRIVE		
Type	M200 & M205	6.4 cu in. (106 cc) Heavy Duty Hydraulic Motor
	M150	4.6 cu in. (75 cc) Heavy Duty Hydraulic Motor
Max. Power Developed	M205	231 hp (174 kW)
	M200	195 hp (146 kW)
	M150	130 hp (97 kW)
Connections		Direct Coupled (Optional Quick Coupler Connection)
Normal Operating Pressure		4000 psi (27.58 MPa)
CONDITIONER		
Drive		Bevel Gearbox To Belt Driven Enclosed Conditioner Timing Gearbox And Driveline.
Bevel Gearbox Lub. Capacity		13.5 oz. (400 ml)
Conditioner Gearbox Lub. Cap.		Lubricated for Life
Roll Type		Intermeshing Steel Bars
Roll Diameter		9.0 in. (229 mm) / 7.0 in. (179 mm) OD Tube
Roll Length		118 in. (3000 mm)
Roll Speed		730 - 1040 rpm
Swath Width		36 - 102 in. (915 - 2540 mm)
Forming Shields		Windrower Mounted Adjustable Forming Shield System
GROUND SPEED		16 mph (25.7 km/h)

NOTES: 1. Specifications and design are subject to change without notice or obligation to revise previously sold units.

6 OPERATION

6.1 OWNER/OPERATOR RESPONSIBILITIES

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the windrower. Contact your Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety signs on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the windrower, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all operators annually.**
- **Be alert for other operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**
- **Ensure that the windrower is properly equipped to safely operate the header. This may include adding ballast according to Windrower Operator's Manual requirements for attachments of this size and mass.**

6.2 OPERATIONAL SAFETY

Follow these safety precautions:

CAUTION

- **Follow all safety and operational instructions given in your windrower Operator's Manual. If you do not have a windrower manual, get one from your dealer and read it thoroughly.**
- **Never attempt to start the windrower engine or operate the windrower except from the operator's seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Do not allow riders on windrower.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Avoid travelling over loose fill, rocks, ditches or holes.**
- **Drive slowly through gates and doorways.**
- **If cutting ditch banks, use extreme caution. If the header hits an obstruction, the front of the windrower will usually swerve towards the ditch.**
- **When working on inclines, travel uphill or downhill when possible.**
- **Never attempt to get on or off a moving windrower.**
- **Do not get off the windrower while the header is in operation.**
- **Stop windrower engine and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shutdown and inspect the machine. Follow proper shutdown procedure:**
  - **engage windrower brake.**
  - **turn off engine and remove key.**
  - **wait for all movement to stop.**
  - **dismount and engage lift cylinder stops before inspecting raised machine.**
- **Operate only in daylight or in good artificial light.**

(continued next page)

- **Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.**

- **Extreme care must be exercised to avoid injury from thrown objects. Do not, under any circumstances, operate the mower conditioner when other people are in the vicinity. Stones and other objects can be thrown great distances by the rotating cutting blades.**
- **The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down when operating the mower conditioner. Replace the curtains if they should become worn or damaged.**

6.3 PRE-SEASON CHECK

Perform the following the beginning of each operating season:

CAUTION

- **Review the Operator's Manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the header, and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and the operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

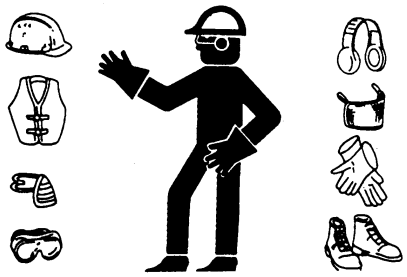
a. Lubricate machine completely. Refer to Section 7.7 LUBRICATION.

b. Perform all annual maintenance. See Section 7.11 MAINTENANCE SCHEDULE.

6.4 DAILY START-UP CHECK

CAUTION

- **Be sure windrower and header are properly attached, all controls are in neutral and windrower brake is engaged.**
- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the windrower to be sure no one is under, on or close to it.**
- **Wear close fitting clothing and protective shoes with slip resistant soles.**
- **Remove foreign objects from the machine and surrounding area.**
- **As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.**
- **You may need:**



  - **a hard hat.**
  - **protective glasses or goggles.**
  - **heavy gloves.**
  - **respirator or filter mask.**
  - **wet weather gear.**

- **Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.**

a. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

NOTE

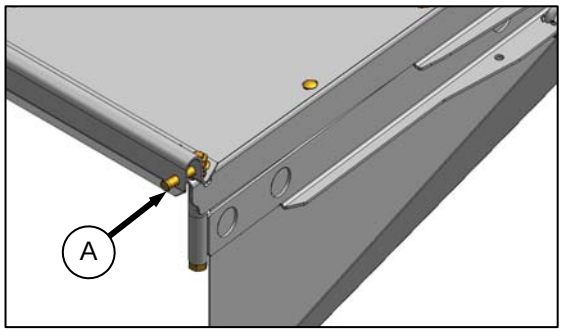
Use proper procedure when searching for pressurized fluid leaks. Refer to Section 7.10 HYDRAULICS.

b. Clean all reflective surfaces on the machine.

c. Perform all Daily maintenance. Refer to Section 7.11 MAINTENANCE SCHEDULE.

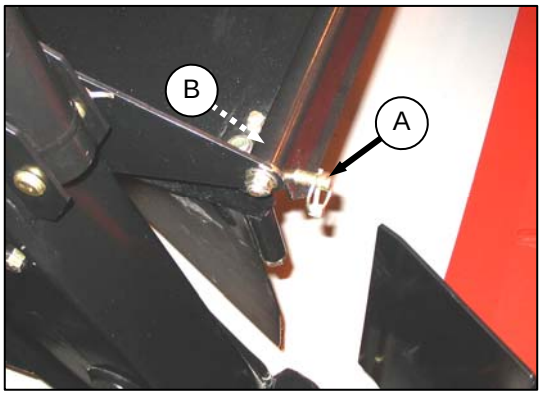
6.5 HEADER ATTACHMENT

a. If not installed, attach the forming shield to the windrower:

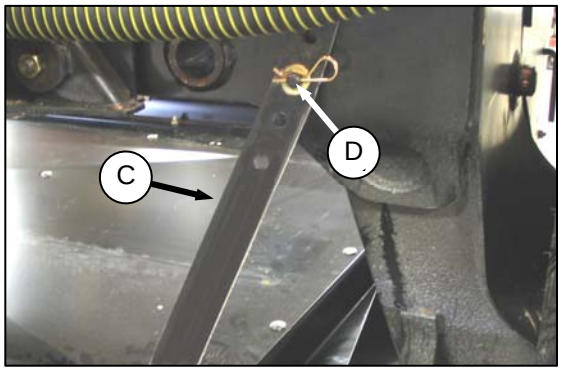


1. Remove the two clevis pins (A) from forming shield forward end.

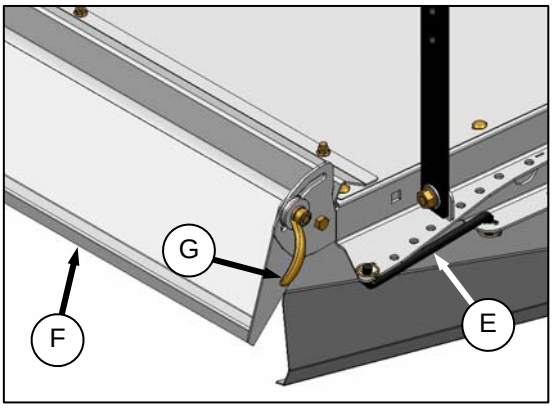
2. Position forming shield under the windrower frame.



3. Locate forming shield onto spacers (B) on windrower legs, and secure with clevis pins (A) and lynch pin.



4. Lift the aft end of the forming shield, and attach straps (C) to pins (D) on windrower frame. Install washer and hairpin to secure strap. Use the "middle" hole, and adjust height to suit the crop.



BOTH SIDES

5. Set forming shield side deflectors to desired width by re-positioning adjuster bars (E). Use same hole location on both sides.
6. Adjust fluffer shield (F) to "middle" position. Loosen handles (G) if required.

b. Attach the R85 header to the Windrower. Refer to the MacDon Self-Propelled Windrower Operator's Manual, and then return to this manual to complete the attachment.

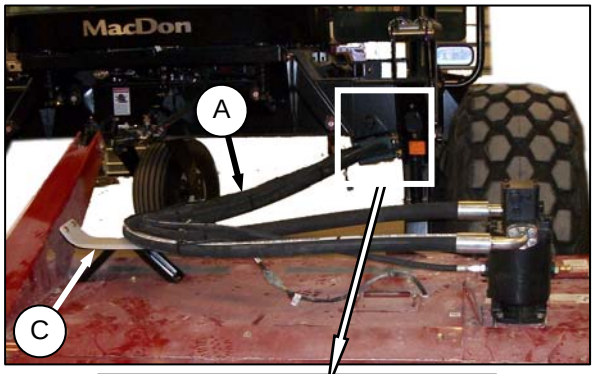
c. Connect the hydraulics and electrical harness. See applicable section in the following pages for your windrower model.

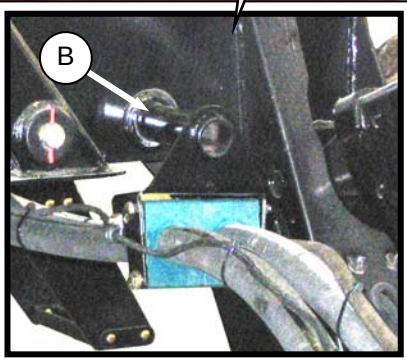
6.5.1 M205 Windrower

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Move windrower left side platform to "open" position.



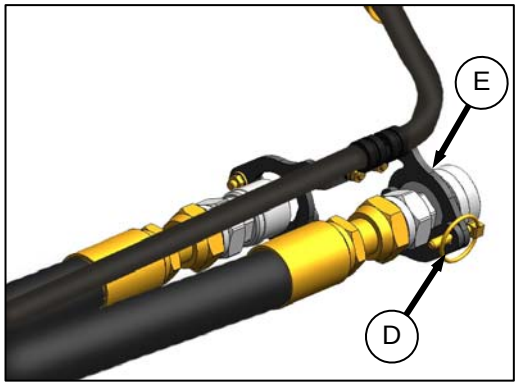


b. Route the hose bundle (A) from the header, under the windrower frame, and insert pin (B) into hole in windrower frame.

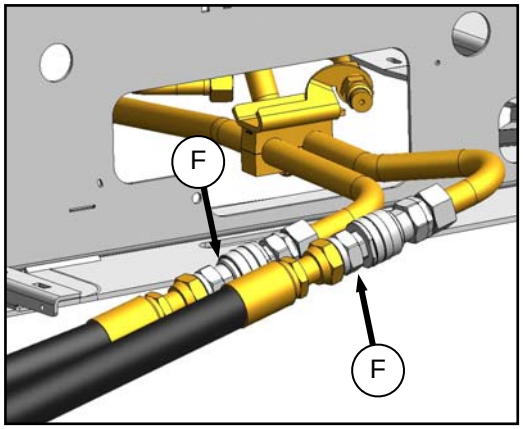
c. Place hoses on support (C).

d. If optional couplers and lock are installed on hoses and lines, proceed as follows. Otherwise, proceed to step e.

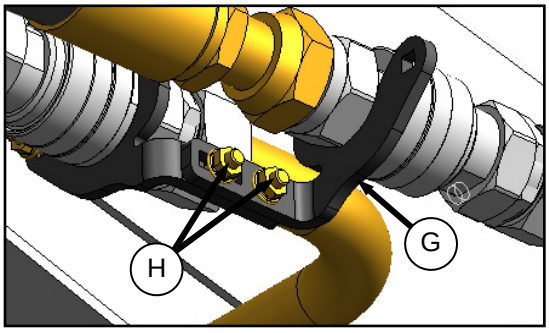
1. If installed, remove coupler lock as follows:



i. Remove lynch pin (D), and open up coupler lock (E).
ii. Remove lock from coupler.

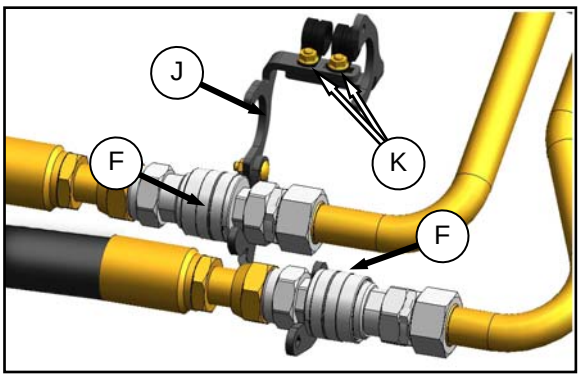


2. Position hose couplers against mating couplers on windrower, and screw sleeves (F) onto mating receptacles.
3. Hand-tighten both coupler sleeves (F).

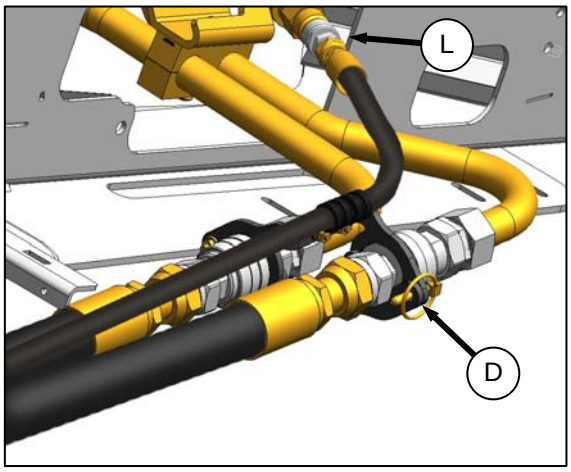


4. Locate lock onto couplers so that retainer (G) locates on fitting adjacent to the sleeve on each coupler. Retainer can be adjusted by loosening bolts (H). Tighten bolts after adjusting.

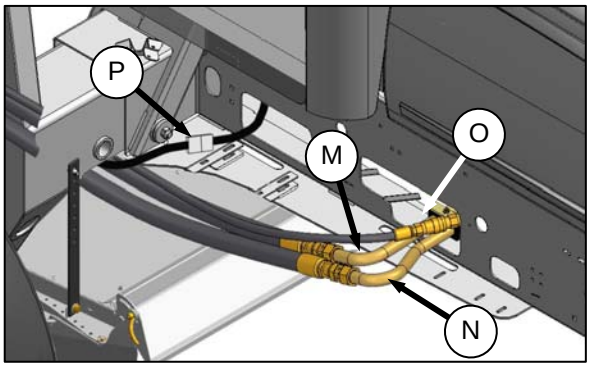
(continued next page)



5. Lower holder (J) onto sleeves (F) so that flats locate on holder. Holder can be adjusted by loosening bolts (K). Tighten bolts after adjusting.



6. Insert lynch pin (D) to secure lock.
7. Remove caps and plugs from the two large hoses and lines.
8. Attach case drain hose coupler at (L).
9. Proceed to step g.



e. Connect large hoses to the lines at (M) and (N) as shown. Torque fittings to 135 ft·lbf (183 N·m).

f. Attach case drain hose coupler at (O).

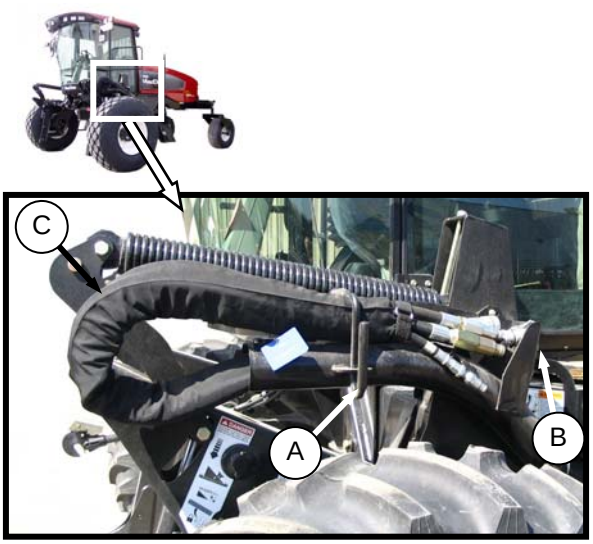
g. Connect electrical harness to connector (P) (located beside the forward valve block on the windrower).

h. Move windrower platform to "closed" position.

6.5.2 M200 Windrower

DANGER

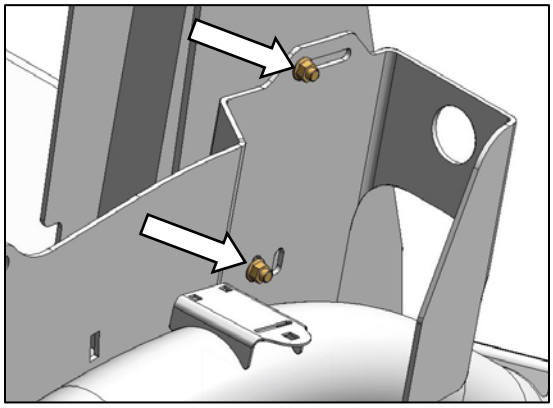
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



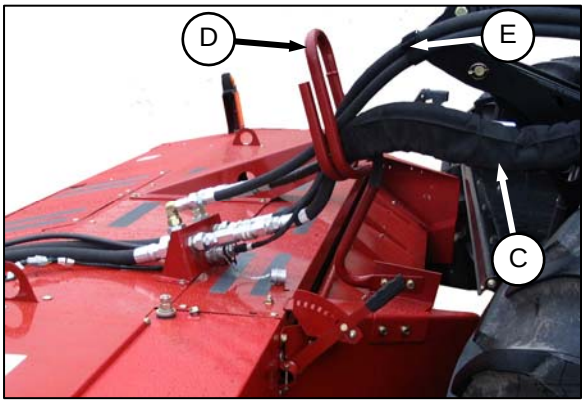
a. Disengage and rotate lever (A) counter clockwise to "fully up" position.

b. Remove cap (B) securing electrical connector to frame.

c. Move hose bundle (C) from windrower, and rest bundle on the header.

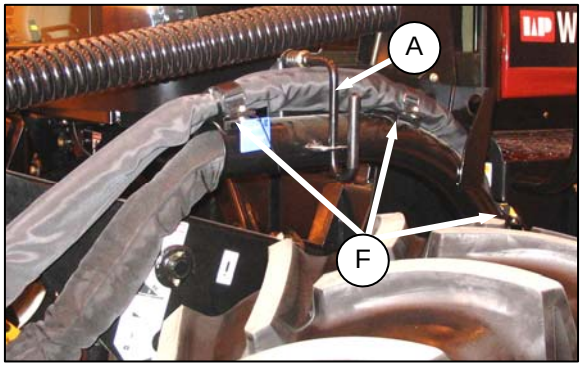


d. Check that hose support is positioned so that lower bolt is in "forward" hole, and support is positioned as shown. Loosen bolts, and adjust as required.



e. Route hose bundle (C) from windrower through support (D) on header.

f. Route header return and pressure hose bundle (E) through support (D) on header, to windrower.

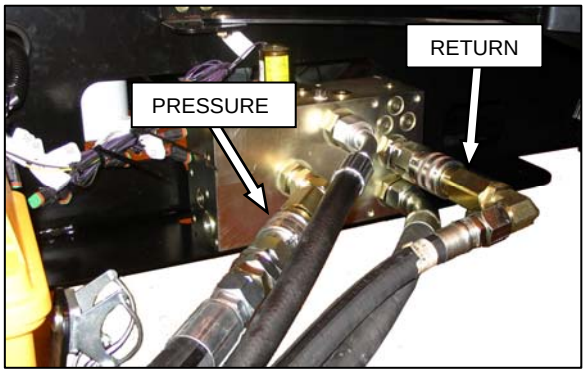


g. Lower and lock lever (A).

h. Secure hose bundles with three cinch straps (F).

(continued next page)

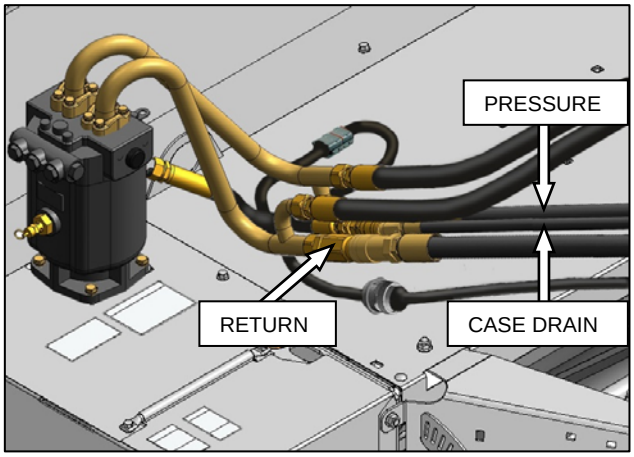
i. Move windrower left side platform to "open" position.



MIDDLE VALVE BLOCK

j. Connect two hose bundle from header to "middle" valve block as shown.

k. Remove caps and plugs on hoses from windrower and lines on header



l. Connect the three hoses from windrower to the fittings on the header as shown.

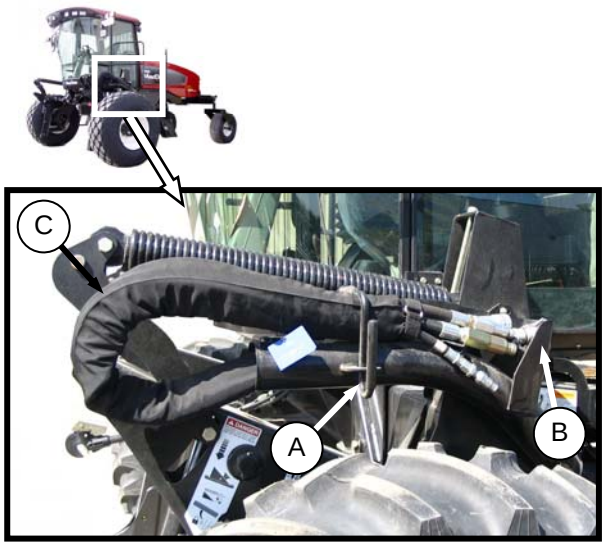
m. Assemble electrical connector as shown.

n. Move platform to "closed" position.

6.5.3 M150 Windrower

DANGER

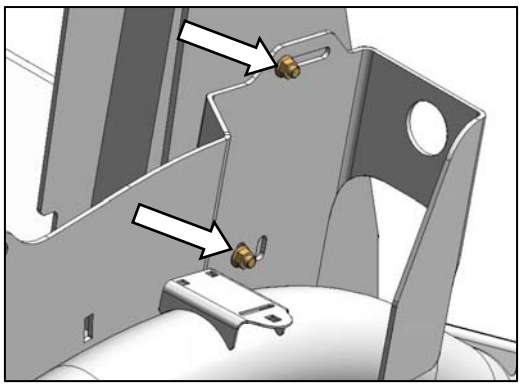
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



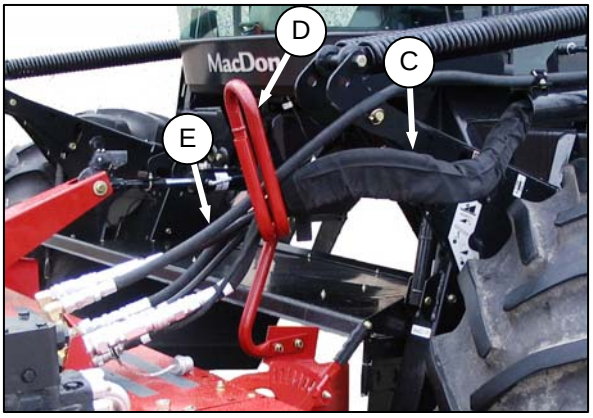
a. Disengage and rotate lever (A) counter clockwise to "fully up" position.

b. Remove cap (B) securing electrical connector to frame.

c. Move hose bundle (C) from windrower, and rest bundle on the header.



d. Check that hose support is positioned so that lower bolt is in "forward" hole, and support is positioned as shown. Loosen bolts, and adjust as required.

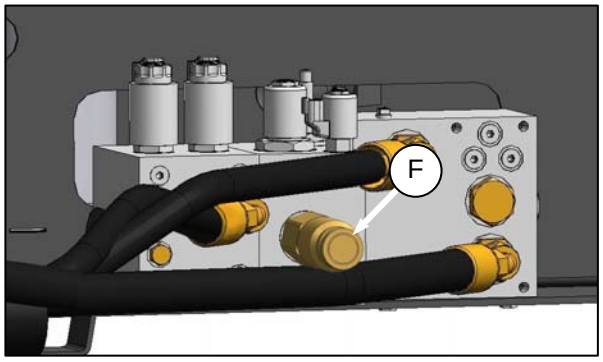


e. Route hose bundle (C) from windrower through support (D) on header.

f. Route header hose (E) through support (D) on header, to windrower.

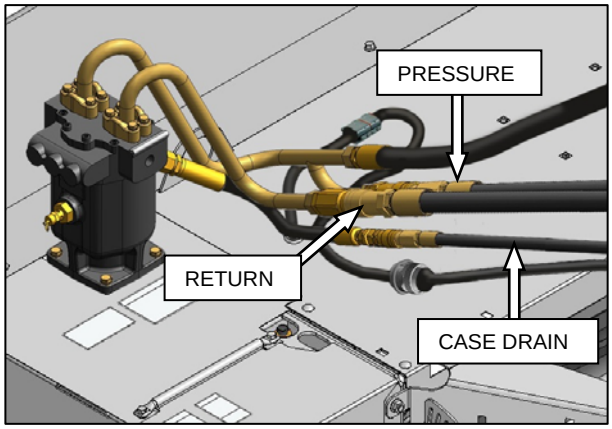
g. Move windrower left side platform to "open" position.

(continued next page)



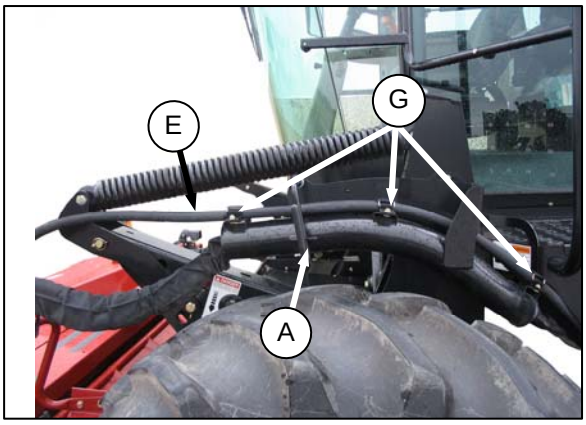
h. Connect single hose (E) from header to coupler (F) on "middle" valve block as shown

i. Remove caps and plugs on hoses from windrower and lines on header.



j. Connect the three hoses from windrower to the fittings on the header as shown.

k. Connect harness from windrower to electrical connector.



l. Lower and lock lever (A). Secure hose (E) with three cinch straps (G).

m. Move windrower platform to "closed" position.

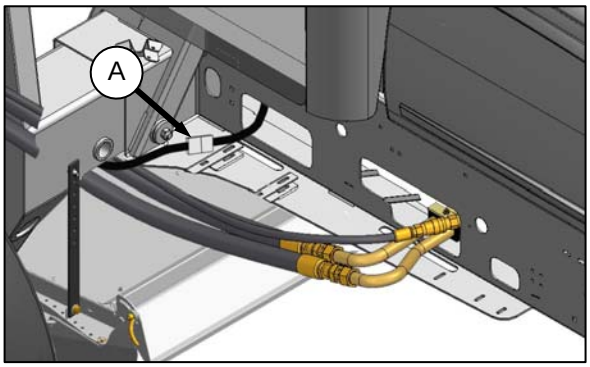
6.6 HEADER DETACHMENT

6.6.1 M205 Windrower

a. Lower header to ground. If ground is soft, place blocks under header.

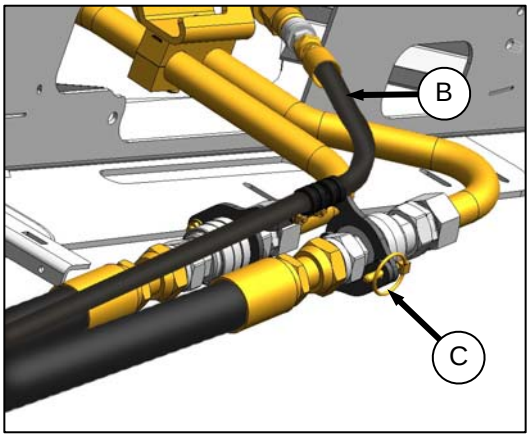
b. Stop engine, and remove key.

c. Move LH (cab-forward) platform to rear of windrower.

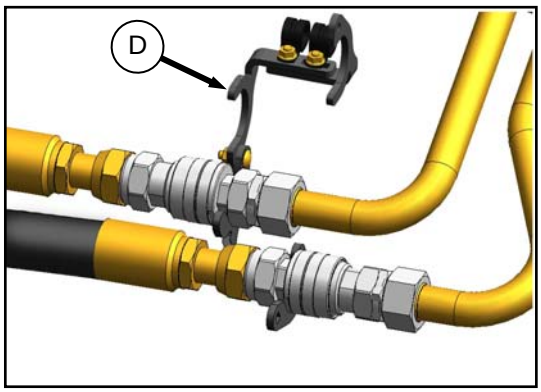


d. Disconnect electrical harness at (A).

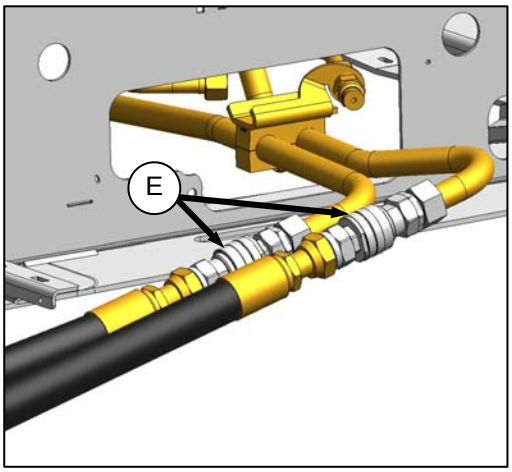
e. If couplers and coupler lock are installed on lines, proceed as follows. Otherwise, proceed to step f.



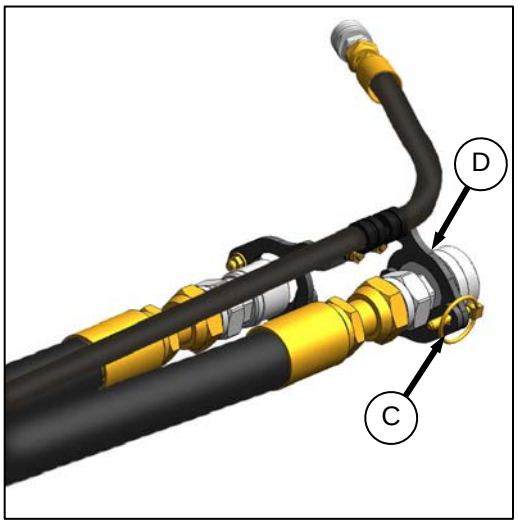
1. Disconnect ½ inch hose (B) from windrower coupler.



2. Remove lynch pin (C), and open up coupler lock (D).
3. Remove lock from couplers.

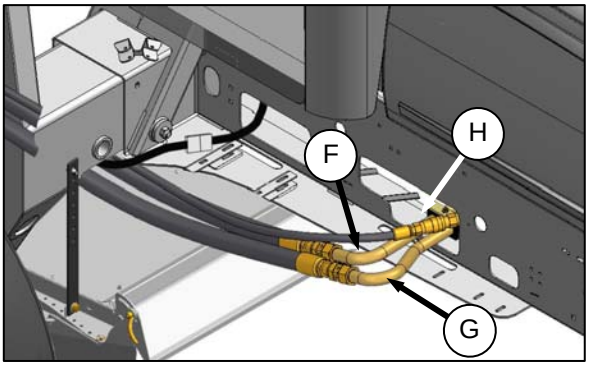


4. Unscrew sleeves (E) on couplers, and separate couplers.
5. Install caps and plugs on open lines.

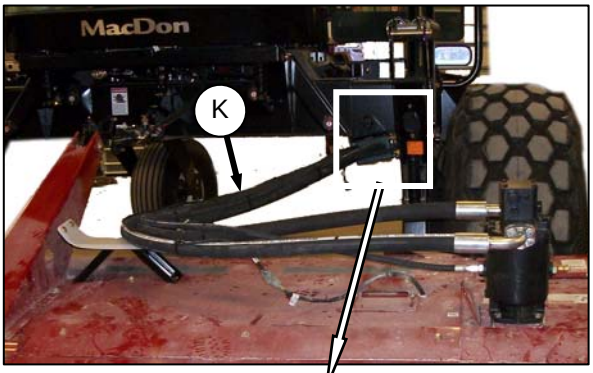


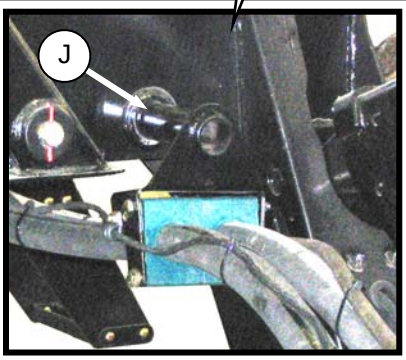
6. Attach coupler lock (D) to hoses, and secure with lynch pin (C).
7. Proceed to step g.

(continued next page)



f. Disconnect hoses from lines (F), (G), and (H) on windrower. Install caps and plugs on open lines.





g. Remove hose support (J) from windrower frame.

h. Route hoses (K) and electrical harness onto header.

i. Move maintenance platform to "closed" position.

j. Detach the header from the windrower. Refer to the MacDon Self-Propelled Windrower Operator's Manual.

6.6.2 M200 Windrower

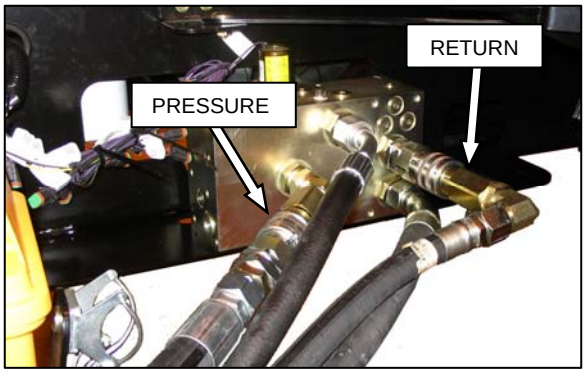
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

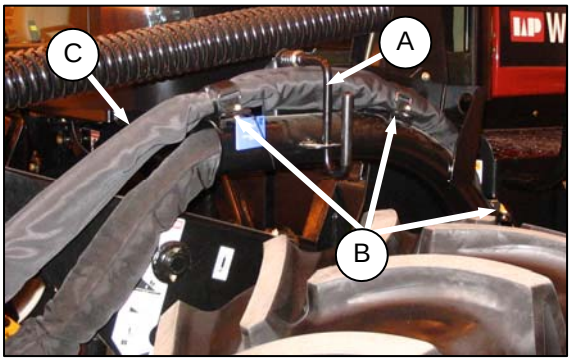
a. Lower header to ground. If ground is soft, place blocks under header.

b. Stop engine, and remove key.

c. Move LH (cab-forward) platform to rear of windrower.



d. Disconnect the two hydraulic couplers from windrower valve.

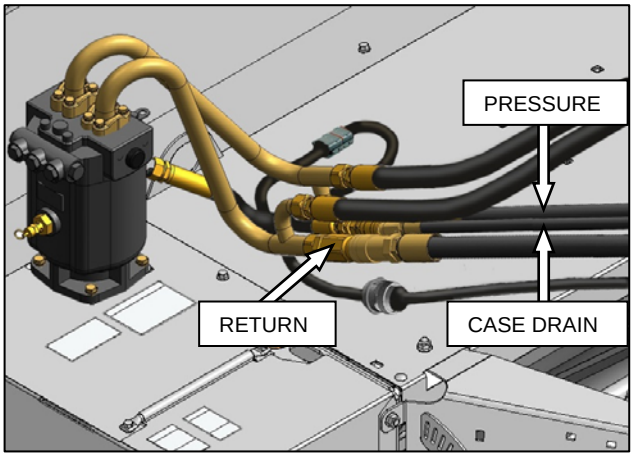


e. Raise lever (A), and undo Velcro® straps (B).

f. Move hose bundle (C) to store on header

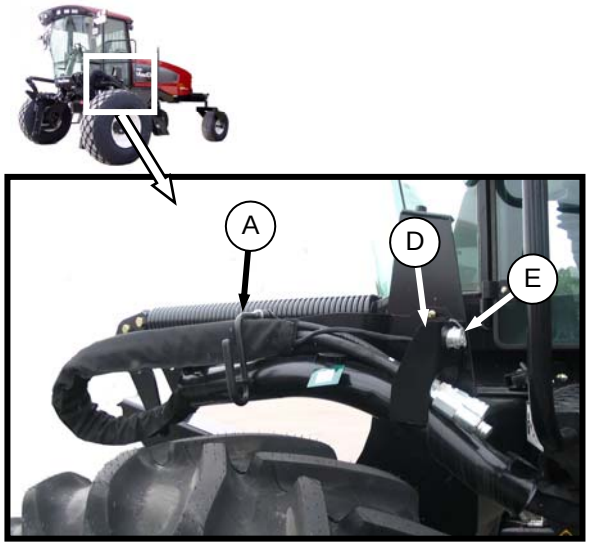
g. Install caps on connectors and hose ends if equipped.

h. At the header, disconnect electrical connector by turning collar counter clockwise, and pulling connector to disengage.



i. Disconnect the two drive couplers, and case drain coupler on header.

(continued next page)



j. Move hose bundle from header, and locate on windrower LH side with hoses in support (D).

k. Rotate lever (A) clockwise, and push to engage bracket.

l. Locate electrical harness through support (D), and attach cap to electrical connector (E).

m. Move windrower platform back to "closed" position.

n. Detach header from windrower. Refer to the Self-Propelled Windrower Operator's Manual.

6.6.3 M150 Windrower

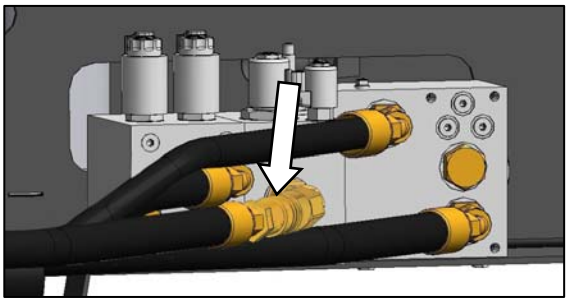
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

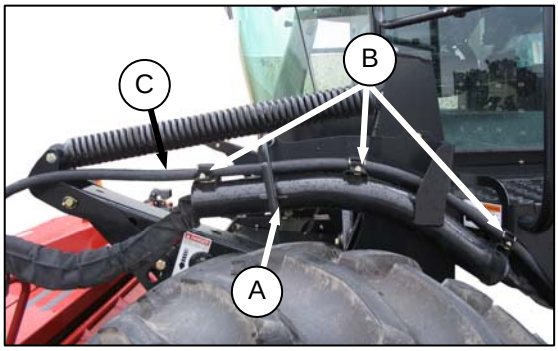
a. Lower header to ground. If ground is soft, place blocks under header.

b. Stop engine, and remove key.

c. Move LH (cab-forward) platform to rear of windrower.



d. Disconnect the hydraulic coupler from windrower valve.

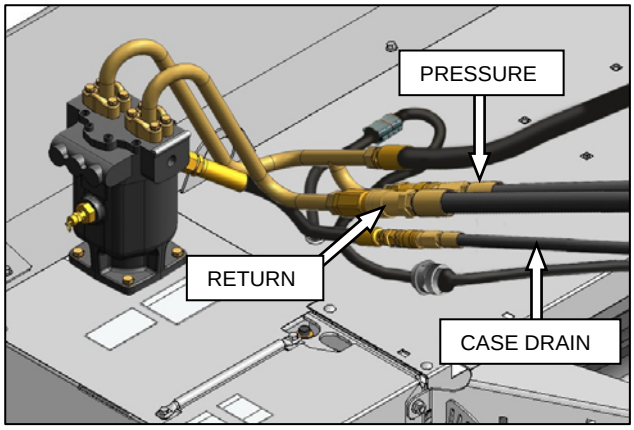


e. Raise lever (A) and undo Velcro® straps (B).

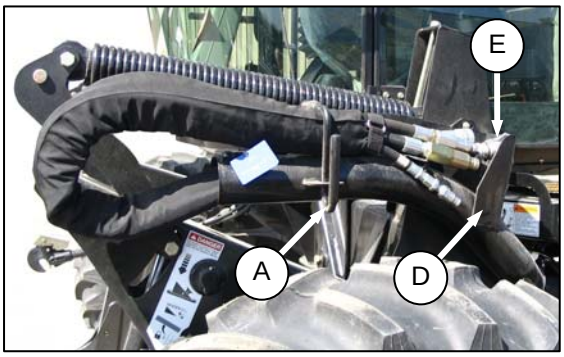
f. Move hose (C) to store on header.

g. Install caps on connectors and hose end if equipped.

h. At the header, disconnect electrical connector by turning collar counter clockwise, and pulling connector to disengage.



i. Disconnect the two drive couplers, and case drain coupler on header.



j. Move hose bundle from header, and locate on windrower LH side with hoses in support (D).

k. Rotate lever (A) clockwise, and push to engage bracket.

l. Locate electrical harness through support (D), and attach cap to electrical connector (E).

m. Move windrower platform back to "closed position".

n. Detach header from windrower. Refer to the Self-Propelled Windrower Operator's Manual.

6.7 BREAK-IN PERIOD

a. After attaching header to windrower for the first time, operate the machine slowly for 5 minutes, watching and listening FROM THE WINDROWER SEAT for binding or interfering parts.

NOTE

Until you become familiar with the sound and feel of your new header, be extra alert and attentive.

WARNING

Before investigating an unusual sound or attempting to correct a problem, shut off windrower, engage parking brake and remove key.

b. Perform the items specified in Section 7.11.1 Break-In Inspection.

6.8 SHUTDOWN PROCEDURE

CAUTION

Before leaving the windrower seat for any reason:

- **Park on level ground if possible.**
- **Lower the header fully.**
- **Place ground speed control in N-DETENT.**
- **Stop engine, and remove key from ignition.**
- **Wait for all movement to stop.**

6.9 TRANSPORTING HEADER

Refer to your MacDon Self-Propelled Windrower Operator's Manual for transporting headers when attached to the windrower.

6.10 HEADER OPERATION

Satisfactory operation of the header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss and increases productivity. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages will affect the performance of the header. You will quickly become adept at adjusting the machine to give you the desired results. Most of the adjustments have been set at the factory but if desired, the settings can be changed to suit crop conditions.

VARIABLE	SECTION
Header Flotation	6.10.1
Roll Gap	6.10.2
Roll Tension	6.10.3
Roll Timing	6.10.4
Forming Shields	6.10.5
Header Angle	6.10.6
Cutting Height	6.10.7
Disc Speed	6.10.8
Ground Speed	6.10.9
Double Windrowing	6.10.10

6.10.1 Header Flotation

Header flotation springs are normally set so that 95 - 105 lbf (426 - 471 N) is required to lift either end of the header "just" off the ground. In rough or stony conditions, it may be desirable to maintain a lighter setting to protect cutting components.

NOTE

When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut.

a. Set the float fine adjustment to mid-range with the windrower float adjustment system in the cab. Refer to your M Series Self-Propelled Windrower Operator's Manual.

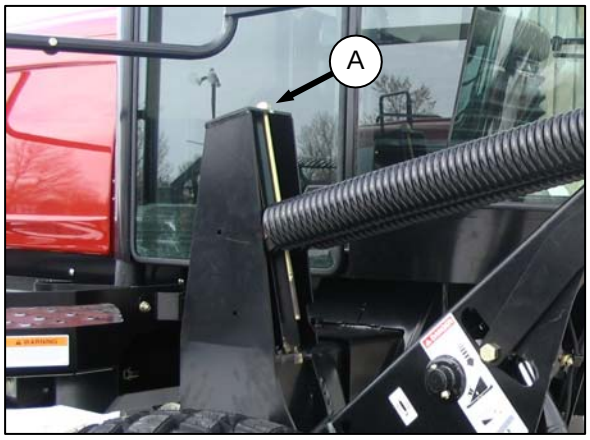
DANGER

Stop engine, and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

b. Check float by grasping the front corner of header and lifting. The force to lift should be 95 - 105 lbf (426 - 471 N), and should be approximately the same at both ends.

c. Perform the following steps to adjust the float (if necessary):

1. Raise the header fully, shutdown the engine, and remove the key.



2. Turn drawbolt (A):
   - clockwise to increase float (makes header lighter), or
   - counter clockwise to decrease float (makes header heavier).
3. Re-check the float.

6.10.2 Roll Gap

Steel rolls "condition" the crop by crimping and crushing the stem in several places. This allows moisture release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap, which is factory-set at 0.5 inch (13 mm).

Correct conditioning of alfalfa, clover and other legumes is usually indicated when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set enough roll gap to achieve this result.

A larger gap (up to 1 inch (25 mm)) may be desirable in thick stemmed cane-type crops; however, too large a gap may cause feeding problems.

Grass type crops may require less gap for proper feeding and conditioning.

If settings below the factory setting are used, it is recommended that the actual gap be visually checked.

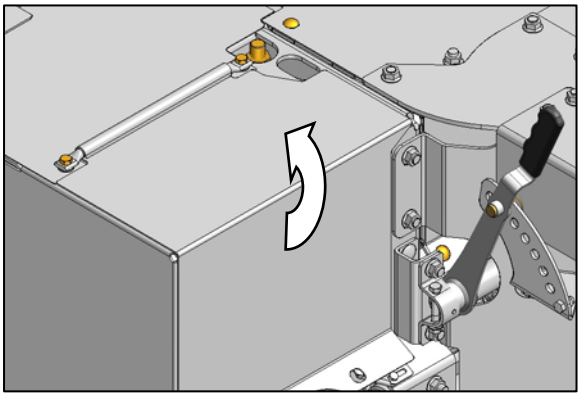
To check roll gap, proceed as follows:

DANGER

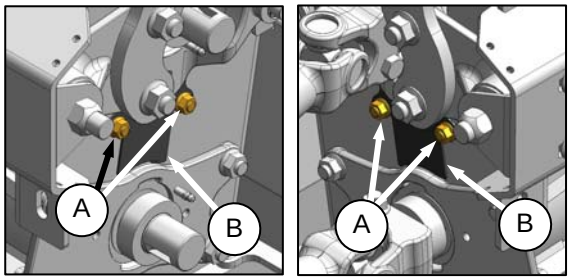
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header fully.

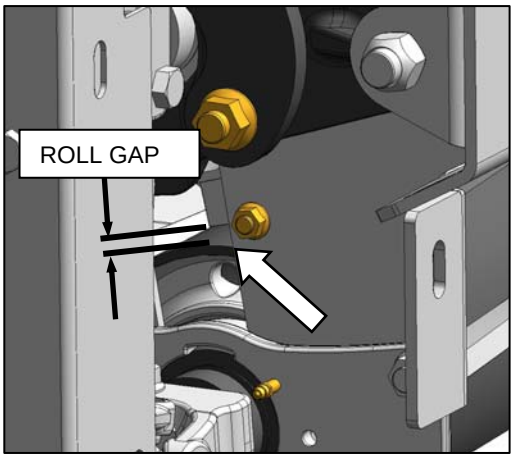
b. Stop engine, and remove key.



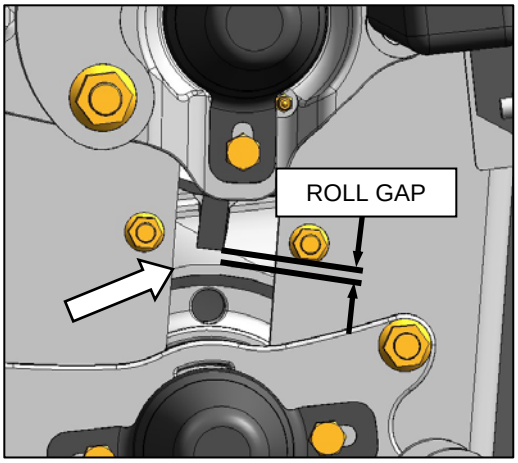
c. Open driveshield at left end of header. See Section 7.5 DRIVESHIELD.



d. At each end of rolls, loosen nuts (A), and slide cover (B) “upwards” to expose observation hole.



LEFT END



RIGHT END

e. Check the gap at each end of the rolls to verify setting, and adjust as necessary.

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- Conditioning is affected, and
- The bars may contact each other.

Refer to Section 6.10.4 Roll Timing.

f. Re-position covers (B), and tighten nuts (A).

g. Close driveshield.

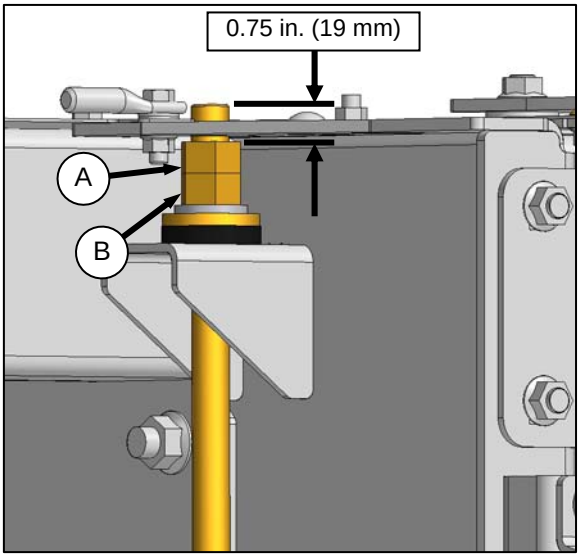
6.10.2.1 Roll Gap Adjustment

a. Lower header fully.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

b. Stop engine, and remove key.



c. Loosen and “back off” upper jam-nut (A) - both sides of conditioner.

d. To increase roll gap, turn lower nut (B) clockwise.

NOTE

The amount of thread protruding through jam-nut indicates roll gap. Factory setting is 0.75 in. (19 mm) which equates to 0.50 in (13 mm) of roll gap.

NOTE

When adjusting roll gap, be sure that the thread protruding is the same on both sides of the conditioner roll to achieve a consistent gap across the rolls.

e. To decrease the roll gap, turn lower nut (B) counter clockwise.

f. Tighten jam-nuts (A), both sides.

6.10.3 Roll Tension

The roll tension (the force holding the rolls together) is factory-set to “maximum”, and is adjustable.

Heavy crops or tough forage that tend to separate the rolls require the maximum roll tension to ensure that material is sufficiently crimped.

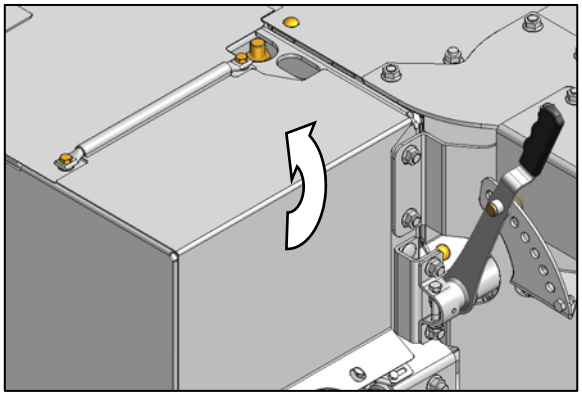
Light alfalfa and short grasses would require less roll tension to lessen over-conditioning.

6.10.3.1 Roll Tension Adjustment

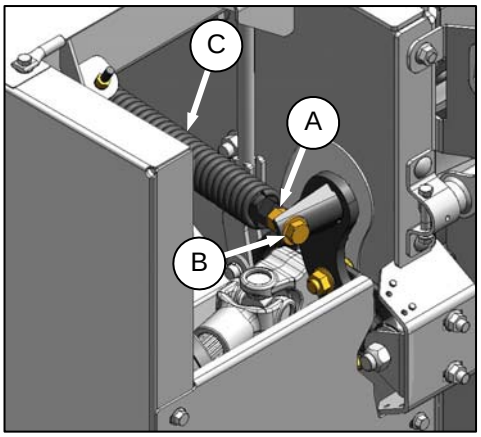
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shutdown windrower, and remove key.



b. Open driveshield at LH end of header. See Section 7.5 DRIVESHIELD.



LH SHOWN

c. To increase the roll tension, loosen jam-nut (A), and turn the spring draw-bolt (B) clockwise to tighten the spring (C).

d. Repeat above step for opposite end of roll.

e. To decrease the roll tension, turn the spring draw-bolts (B) counter clockwise to loosen the springs.

IMPORTANT

Turn each bolt equal amounts. Each turn of the bolt changes the roll tension by approximately 6.5 lbf (29 N).

f. Tighten jam-nut (A) after adjusting tension.

g. Close driveshield.

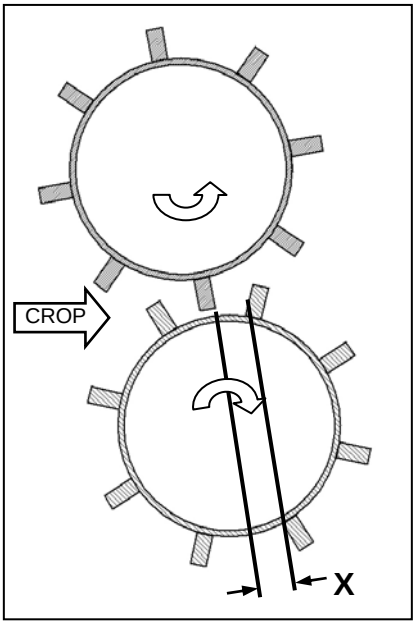
6.10.4 Roll Timing

For proper conditioning, the rolls must be properly timed with each steel bar on one roll centered between two bars of the other roll as shown. The factory setting should be suitable for most crop conditions.

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- Conditioning is affected, and
- The bars may contact each other.



To check roll timing **'X'**, proceed as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

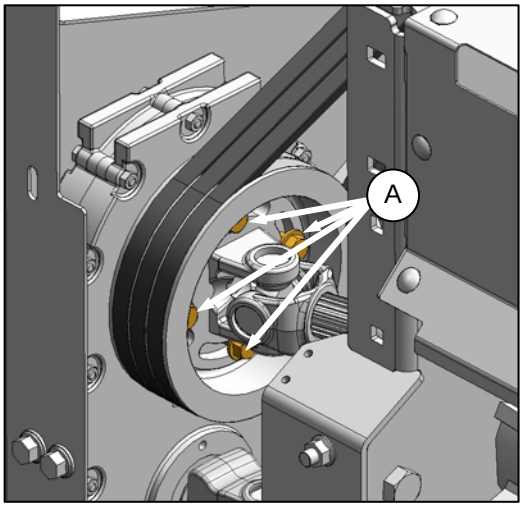
a. Lower header fully, stop engine, and remove key.

b. Open the driveshield. See Section 7.5 DRIVESHIELD.

c. Examine roll timing (distance **'X'**) at each end of the rolls with the header fully lowered. Each steel bar on one roll should be centered between two bars of the other roll so that distance **'X'** is approximately equal on both sides of the bar.

6.10.4.1 Roll Timing Adjustment

Adjust roll timing, if necessary, as follows:



a. Loosen four bolts (A) in slots of yoke plate on upper roll universal shaft.

b. Manually rotate upper roll it stops. Make a mark on yoke flange to align with the center of one of the bolt (A) heads.

c. Manually rotate upper roll in opposite direction until it stops. Make a second mark on yoke flange to align with the bolt.

d. Determine the center between the two marks, and mark a third line on the yoke flange.

e. Rotate the upper roll until the bolt "lines up" with the third line.

f. Tighten bolts (A) to secure the position.

6.10.5 Forming Shields

WARNING

Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position should be based on the following factors:

- weather conditions (rain, sun, humidity, wind),
- type and yield of crop,
- drying time available, and
- method of processing (bales, silage, "green-feed")

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to Section 6.11 HAYING TIPS, for more information.

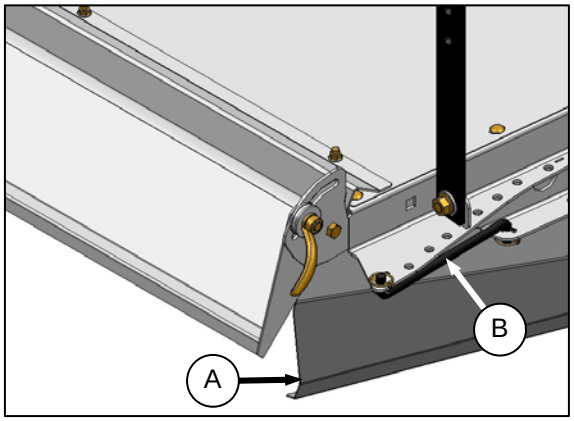
A narrower windrow may be preferred for ease of pick-up, and when drying is not critical, for example, when cutting for silage or "green-feed".

6.10.5.1 Side Deflectors

The position of the side deflectors control the width and placement of the windrow.

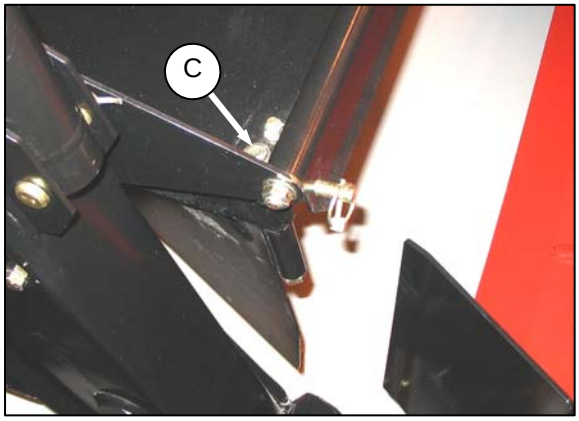
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



BOTH SIDES

a. Set forming shield side deflectors (A) to desired width by re-positioning adjuster bars (B) in holes in forming shield cover. To ensure windrow placement is centered, adjust both side deflectors to the same position.



b. If side deflector attachment is too tight or too loose, tighten or loosen nut (C) as required.

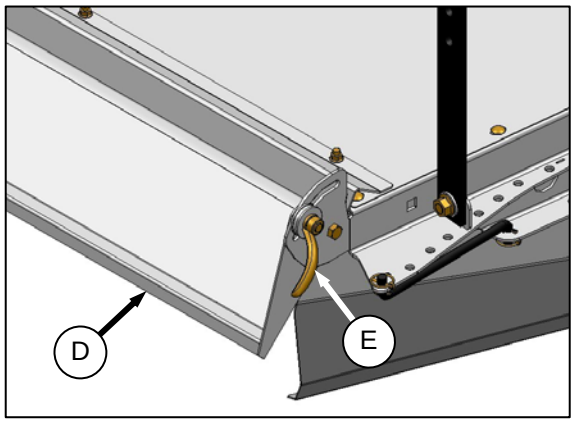
6.10.5.2 Rear Deflector (Fluffer Shield)

The rear deflector slows the crop exiting the conditioner rolls, directs the flow downward, and "fluffs" the material.

Adjust the deflector as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



BOTH SIDES

a. For more crop control in light material, lower the deflector (D) by pushing "down" on one side of the deflector, and then on the other side.

NOTE

Locking handles (E) are located at either end of the deflector, and may be loosened slightly.

b. For heavier crops, raise the deflector by pulling "up" on one side, and then on the other side.

NOTE

For even windrow formation, be sure the deflector is not twisted.

c. Tighten handles (E) to secure deflector position.

6.10.5.3 Baffle

The baffle (F) determines the width and height of the windrow.

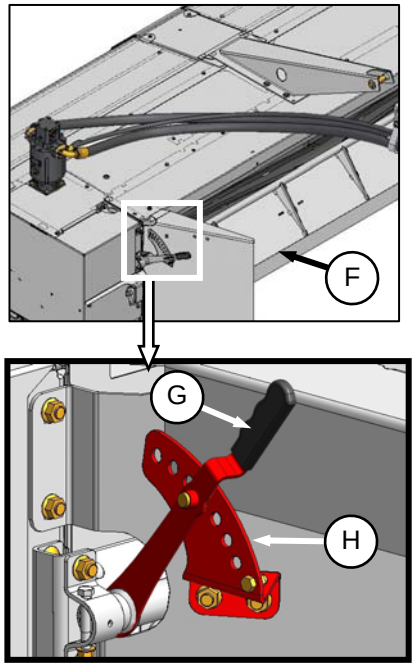
It is located immediately behind and above the conditioning rolls, and can be positioned to:

- Direct the crop flow into the forming shield for narrow and moderate width windrows, or
- Direct crop downward to form a wide swath.

Adjust the baffle as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



a. Pull lever (G) to disengage from bracket (H), and move lever:

- "forward" to raise baffle (F), or
- "backward" to lower baffle (F).

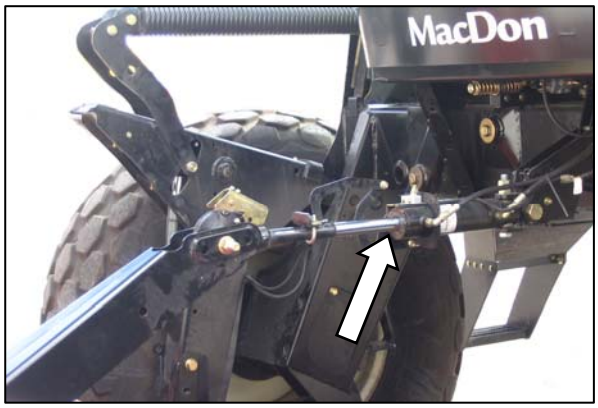
b. Release lever into bracket.

6.10.6 Header Angle

Header (or cutterbar) angle can be varied from 0 - 8° below horizontal.

Choose an angle that maximizes performance for your crop and field conditions.

A flatter angle provides better clearance in stony conditions, while a steeper angle is required in down crops for better lifting action.



The header angle can be hydraulically adjusted from the windrower cab using hydraulic cylinder without shutting down the windrower.

Refer to your MacDon Self-Propelled Windrower Operator's Manual.

6.10.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/header, and the skid shoe settings.

Cutting height should be adjusted for optimum cutting performance without allowing excessive build-up of mud and soil inside the header that can lead to poor crop flow and increased wear on cutting components.

Choose an angle that maximizes performance for your crop and field conditions. Refer to Section 6.10.6 Header Angle.

Optional adjustable skid shoes are available to also provide different cutting heights as described below:

- Lowering the skid shoes or decreasing header angle increases the cutting height. This may be desirable in stony conditions, to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.
- Raising the skid shoes and increasing header angle allows the crop to be “shaved”.

To minimize damage to cutterbar components, scooping soil, or soil build-up at the cutterbar in damp conditions, header float should be set as light as possible without causing excessive bouncing.

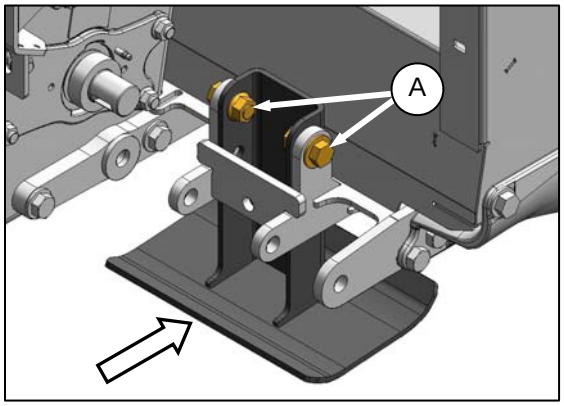
When the float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut.

Set up the header as follows:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage header lift cylinder stops before going under machine for any reason.

a. Raise header fully, stop engine, and remove key.



b. Remove bolts (A).
c. Raise or lower skid shoe.
d. Re-install bolts (A).
e. Repeat for skid shoe at opposite end of header.
f. Check header float as described in Section 6.10.1 Header Flotation.
g. Adjust header angle to desired working position using the machine's header angle controls. If angle is not critical, set it to "mid-position". Refer to Section 6.10.6 Header Angle for more information.

6.10.8 Disc Speed

The disc header can be used to cut a variety of crops.

For the best cutting results, a range of disc speeds is recommended for each type of crop and condition.

See table below.

CROP	CONDITION	DISC RPM
Alfalfa	Heavy	2300 - 2500
	Light	1600 - 2000
Sudan, Sorghum, Haygrazer, Timothy	Tall and Stemmy	2300 - 2500
Short Grass	Dense	2500
	Thin	1800 - 2000

Disc speeds are set and adjusted from the cab without shutting down the windrower.

Refer to your MacDon Self-Propelled Windrower Operator's Manual.

6.10.9 Ground Speed

CAUTION

Reduce speed when turning, crossing slopes, or when travelling over rough ground.

a. Choose a ground speed that allows the cutterbar and conditioner to cut the crop smoothly and evenly. Try different combinations of header speed and ground speed to suit your specific crop. Refer to your MacDon Self-Propelled Windrower Operator's Manual for changing ground speed.

b. In tough cutting conditions (such as native grasses) the disc speed will need to be increased.

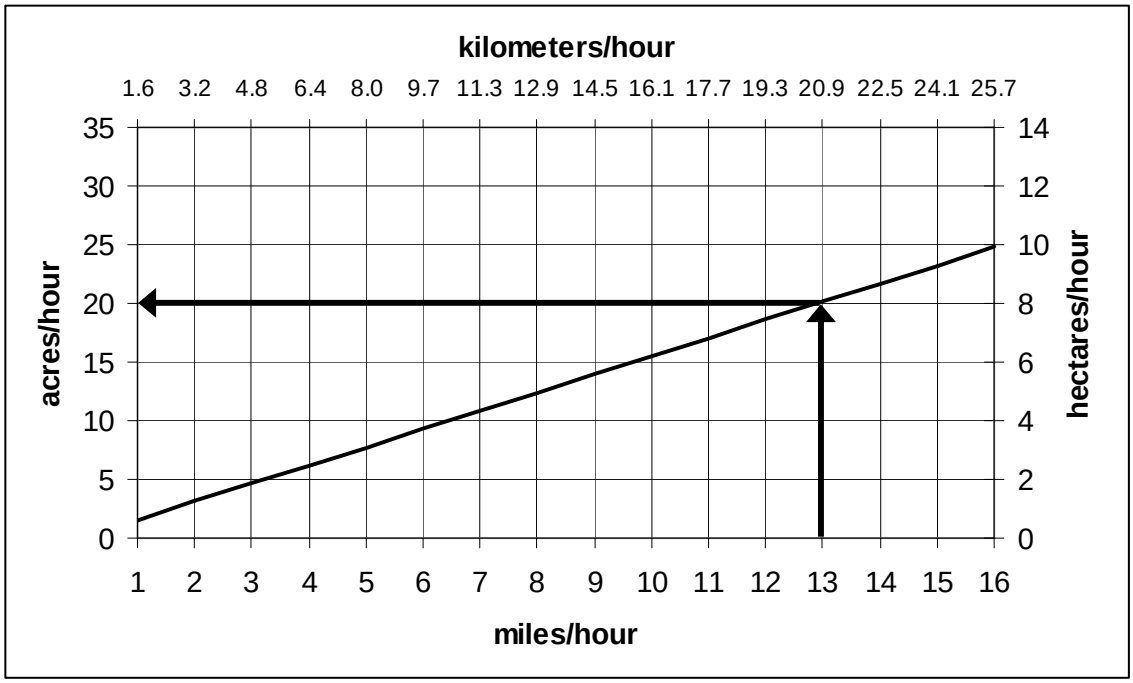
c. In light crops the header speed can be reduced while maintaining ground speed.

NOTE

Operating the header at the minimum disc speed will extend the wear life of cutting components.

d. The chart below indicates the relationship between ground speed and area cut for a 13 FT header.

Example: At ground speed of 13 mph (21 km/h), the area cut would be approximately 20 acres (8 hectares) per hour.



6.10.10 Double Windrowing

If your windrower is equipped with the Double Windrow Attachment (DWA), refer to MacDon M Series Windrower Double Windrow Attachment Manual (Form 169216) for operating and maintenance instructions.

The manual is shipped with the DWA Kit.

6.10.11 Tall Crop Dividers

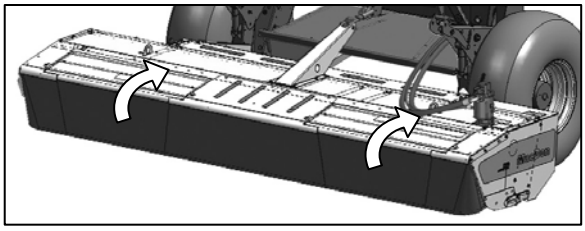
The tall crop dividers (one on each end of header) assist in clean crop dividing and cutterbar entry in tall crops.

They are not adjustable, but can easily be removed as follows:

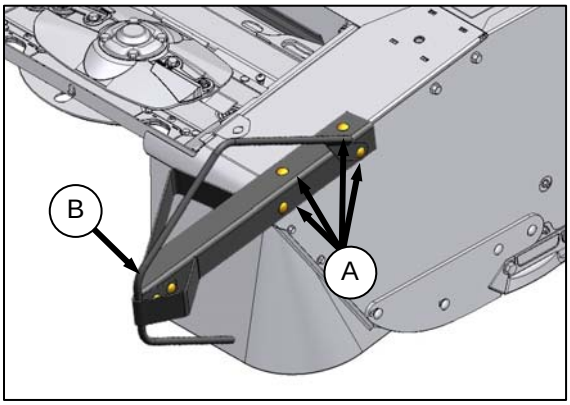
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

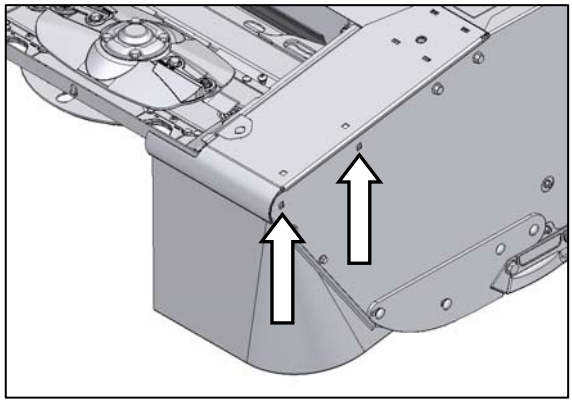
a. Lower header to ground, shutdown windrower, and remove key.



b. Open cutterbar doors.



c. Remove the four bolts (A), and remove deflector (B).



d. Re-install the four bolts.

e. Close cutterbar doors.

6.10.12 Header Pan

The header pan is located behind the cutterbar, and helps prevent material loss and wrapping in certain crops, such as grass seed, oats, and tall stalky crops.

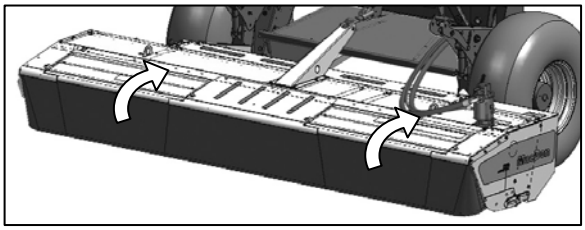
In conditions where more soil and stones are being picked up by the cutterbar, it may be desirable to remove the pan to allow the debris to fall out before being fed into the conditioner.

DANGER

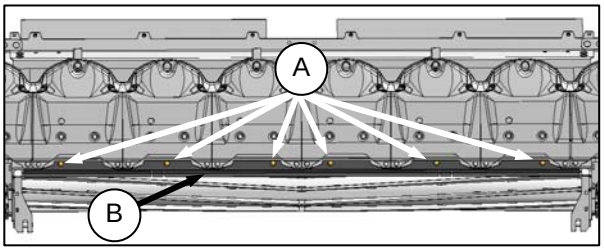
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

Removal:

a. Raise header fully, stop engine, and remove key.
b. Engage header lift cylinder stops.



c. Raise cutter bar doors for access to the bolts securing pan to frame.



d. Remove six bolts (A) securing pan (B) to header, and remove pan.

Installation:

a. Locate pan (B) under header frame, and hold in place.
b. Install six 1/2 in. x 1 carriage bolts (A) and flanged locknuts. Tighten hardware.

6.11 HAYING TIPS

6.11.1 Curing

a. A quick cure will maintain top quality because:
   - Protein is lost for each day hay lies on the ground,
   - The sooner the cut hay is harvested, the earlier the start for next growth.

b. Leaving the windrow as wide and thin as possible makes for the quickest curing.

c. The cured hay should be baled as soon as possible.

6.11.2 Topsoil Moisture

a. On wet soil, the general rule of "wide and thin" does not apply. A narrower windrow will dry faster than hay left flat on wet ground.

b. When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level:

LEVEL	% MOISTURE	CONDITION
Wet	Over 45%	Soil is Muddy
Damp	25 - 45%	Shows Footprints
Dry	Under 25%	Surface is Dusty

c. If ground is wet due to irrigation, wait until soil moisture drops below 45%.

d. If ground is wet due to frequent rains, cut when weather allows, and let the forage lie on wet ground until it dries to the moisture level of the ground.

e. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

6.11.3 Weather and Topography

a. Cut as much hay as possible by midday, when drying conditions are best.

b. Fields sloping south get up to 100% more exposure to the sun's heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields, and chopping those facing north.

c. When relative humidity is high, the evaporation rate is low, and hay dries slower.

d. If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

e. Cutting hay perpendicular to the direction of the prevailing winds is also recommended.

6.11.4 Windrow Characteristics

It is recommended that a windrow with the following characteristics be produced. Refer to Section 6.10 HEADER OPERATION for instructions on adjusting the header.

CHARACTERISTIC	ADVANTAGE
High and Fluffy	The movement of air through the windrow is more important to the curing process than is direct sunlight.
Consistent Formation, Not Bunchy	Permits an even flow of material into the baler, chopper etc.
Even Distribution of Material Across Windrow	Results in even and consistent bales to minimize handling and stacking problems.
Properly Conditioned	Prevents excessive leaf damage.

6.11.5 Driving On Windrow

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked.

If practical, set forming shields for a narrower windrow that can be straddled.

NOTE

Driving on the windrow in high yielding crops may be unavoidable if a full width windrow is necessary.

6.11.6 Raking and Tedding

a. Raking or tedding speeds up drying, however the benefits must be weighed against the additional leaf losses which will result. There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

b. Large windrows on damp or wet ground should be turned over when they reach 40 - 50% moisture. Hay should <u>not</u> be raked or tedded at less than 25% moisture, or excessive yield losses will result.

6.11.7 Chemical Drying Agents

a. Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster. However, treated hay lying on wet ground will also absorb ground moisture faster.

b. Before deciding to use a drying agent, costs and benefits relative to your area should be carefully compared.

6.12 UNPLUGGING THE HEADER

DANGER

Stop windrower engine, and remove key before removing plugged material from header. A child or even a pet could engage the drive.

a. Stop forward movement of the windrower, and disengage the header.

b. Raise header fully, shut off engine, and remove key.

c. Engage header lift cylinder locks.

WARNING

Wear heavy gloves when working around cutterbar.

d. Open cutterbar doors, and clean off cutterbar by hand.

6.13 STORAGE

Do the following at the end of each operating season:

a. Clean the windrower thoroughly.

CAUTION

Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

b. Store in a dry, protected place if possible. If stored outside, always cover windrower with a waterproof canvas or other protective material.

c. Raise header, and engage header lift cylinder lock-outs.

d. If possible, "block up" the windrower to take weight off tires.

e. Repaint all worn or chipped painted surfaces to prevent rust.

f. Loosen drive belt.

g. Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods and sliding surfaces of components. Oil cutterbar components to prevent rust.

h. Check for worn components and repair as necessary.

i. Check for broken components and order replacement from your dealer. Attention to these items right away will save time and effort at beginning of next season.

j. Replace or tighten any missing or loose hardware. Refer to Section 7.3.1 Recommended Torques.

k. Remove tall crop dividers (if equipped) to reduce space required for inside storage.

7 MAINTENANCE AND SERVICING

The following instructions are provided to assist the Operator in the use of the disc header. Detailed maintenance, service, and parts information are contained in the Service Instruction Manual and Parts Catalog that are available from your Dealer.

Log hours of operation, and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.11 MAINTENANCE SCHEDULE.

7.1 PREPARATION FOR SERVICING

CAUTION

To avoid personal injury, before servicing header or opening drive covers, perform the following:

- **Fully lower the header. If necessary to service in the raised position, always engage header lift cylinder stops.**
- **Stop engine, and remove key.**
- **Engage park brake.**
- **Wait for all moving parts to stop.**

7.2 RECOMMENDED SAFETY PROCEDURES

- **Park on level surface when possible. Block wheels securely if windrower is parked on an incline. Follow all recommendations in your Windrower Operator's Manual.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**
- **Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and heavy gloves.**

- **If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and disc) to move. Stay clear of driven components at all times.**

- **Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.**

- **Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Replace all shields removed or opened for service.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.**
- **Keep the machine clean. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**

7.3 MAINTENANCE SPECIFICATIONS

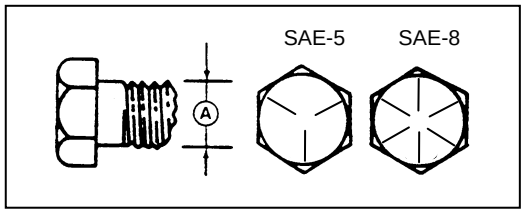
7.3.1 Recommended Torques

- Tighten all bolts to the torques specified in chart unless otherwise noted throughout this manual.
- Check tightness of bolts periodically, using bolt torque chart as a guide.
- Replace hardware with the same strength bolt.
- Torque figures are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless specified in this manual.
- When using locking elements, increase torque values by 5%.

7.3.1.1 SAE Bolts

BOLT DIA. "A"	NC BOLT TORQUE*			
	SAE-5		SAE-8	
in.	lbf·ft	N·m	lbf·ft	N·m
1/4	9	12	11	15
5/16	18	24	25	34
3/8	32	43	41	56
7/16	50	68	70	95
1/2	75	102	105	142
9/16	110	149	149	202
5/8	150	203	200	271
3/4	265	359	365	495
7/8	420	569	600	813
1	640	867	890	1205

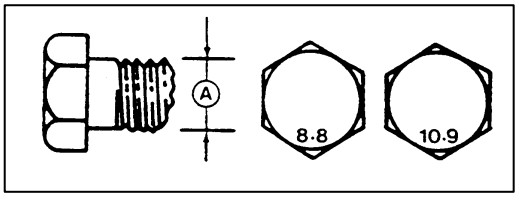
* Torque categories for bolts and capscrews are identified by their head markings.



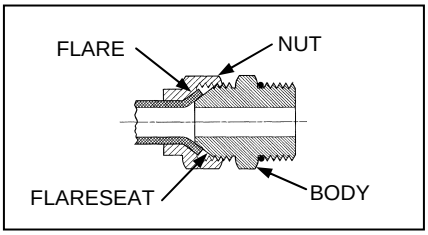
7.3.1.2 Metric Bolts

BOLT DIA. "A"	STD COARSE BOLT TORQUE*			
	8.8		10.9	
	lbf·ft	N·m	lbf·ft	N·m
M3	0.4	0.5	1.3	1.8
M4	2.2	3	3.3	4.5
M5	4	6	7	9
M6	7	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M14	103	140	148	200
M16	166	225	229	310
M20	321	435	450	610
M24	553	750	774	1050
M30	1103	1495	1550	2100
M36	1917	2600	2710	3675

* Torque categories for bolts and capscrews are identified by their head markings.



7.3.1.3 Flare-Type Hydraulic Fittings



a. Check flare and flare seat for defects that might cause leakage.

b. Align tube with fitting before tightening.

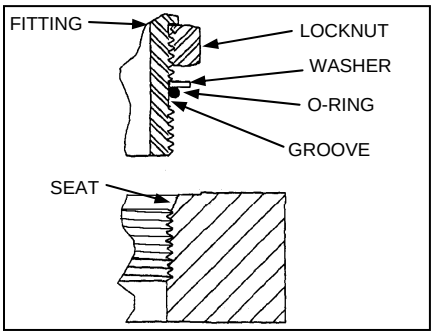
c. Lubricate connection, and hand-tighten swivel nut until snug.

d. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body, and with the second, tighten the swivel nut to the torque shown.

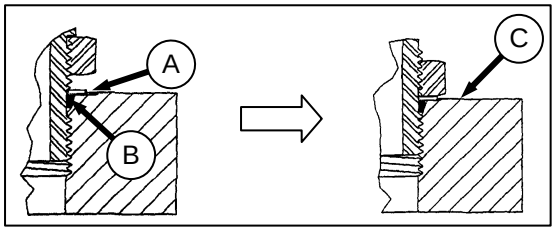
SAE NO.	TUBE SIZE O.D. (in.)	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
				ft·lbf	N·m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/16	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	¾	1/8

* The torque values shown are based on lubricated connections as in re-assembly.

7.3.1.4 O-Ring Boss (ORB) Hydraulic Fittings



a. Inspect O-ring and seat for dirt or obvious defects.



b. On angle fittings, "back off" the lock nut until washer (A) "bottoms out" at top of groove (B) in fitting.

c. Hand-tighten fitting until back up washer (A) or washer face (if straight fitting) bottoms on part face (C), and O-ring is seated.

d. Position angle fittings by unscrewing no more than one turn.

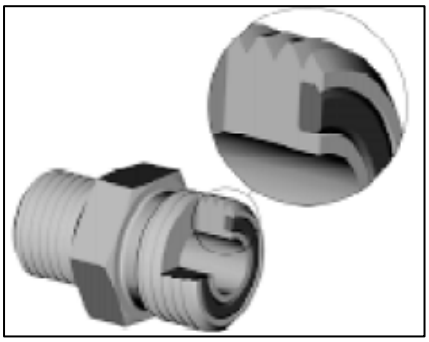
e. Tighten straight fittings to torque shown.

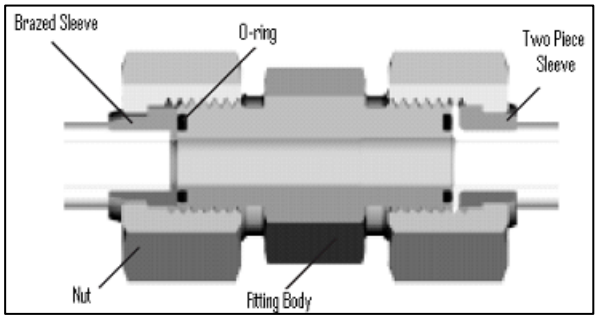
f. Tighten angle fittings to torque shown in the following table, while holding body of fitting with a wrench.

SAE NO.	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
			ft·lbf	N·m	Flats	Turns
3	3/8	1/2	6	8	2	1/3
4	7/16	9/16	9	12	2	1/3
5	1/2	5/8	12	16	2	1/3
6	9/16	11/16	18	24	2	1/3
8	3/4	7/8	34	46	2	1/3
10	7/8	1	46	62	1-1/2	1/4
12	1-1/16	1-1/4	75	102	1	1/6
14	1-3/16	1-3/8	90	122	1	1/6
16	1-5/16	1-1/2	105	142	3/4	1/8
20	1-5/8	1-7/8	140	190	3/4	1/8
24	1-7/8	2-1/8	160	217	1/2	1/12

* The torque values shown are based on lubricated connections as in re-assembly.

7.3.1.5 O-Ring Face Seal (ORFS) Hydraulic Fittings





SAE NO.	THD SIZE (in.)	TUBE O.D. (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)**	
			ft·lbf	N·m	Tube Nuts	Swivel & Hose
3	***	3/16	---	---	---	---
4	9/16	1/4	11 - 12	14 - 16	1/4 -1/2	1/2 - 3/4
5	***	5/16	---	---	---	---
6	11/16	3/8	18 - 20	24 - 27	1/4 -1/2	1/2 - 3/4
8	13/16	1/2	32 - 35	43 - 47		
10	1	5/8	45 - 51	60 - 68		
12	1-3/16	3/4	67 - 71	90 - 95		1/3 -1/2
14	1-3/16	7/8	67 - 71	90 - 95		
16	1-7/16	1	93 - 100	125 - 135		
20	1-11/16	1-1/4	126 - 141	170 - 190		
24	2	1-1/2	148 - 167	200 - 225		
32	2-1/2	2	---	---	---	---

* Torque values and angles shown are based on lubricated connection, as in re-assembly.

** Always default to the torque value for evaluation of adequate torque.

*** O-ring face seal type end not defined for this tube size.

a. Check components to ensure that the sealing surfaces and fitting threads are free of burrs, nicks, and scratches, or any foreign material.

b. Apply lubricant (typically Petroleum Jelly) to O-ring and threads. If O-ring is not already installed, install O-ring.

c. Align the tube or hose assembly. Ensure that flat face of the mating flange comes in full contact with O-ring.

d. Thread tube or hose nut until hand-tight. The nut should turn freely until it is bottomed out. Torque fitting further to the specified number of F.F.F.T (“Flats From Finger Tight”), or to a given torque value in the table shown in the opposite column.

NOTE

If available, always hold the hex on the fitting body to prevent unwanted rotation of fitting body and hose when tightening the fitting nut.

e. When assembling unions or two hoses together, three wrenches will be required.

7.3.2 Recommended Lubricants

- Your machine can operate at top efficiency only if clean lubricants are used.
- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

IMPORTANT

Do <u>not</u> overfill the cutterbar when adding lubricant. Overheating and failure of cutterbar components may occur if overfilled.

LUBRICANT	SPEC.	DESCRIPTION	USE	CAPACITIES
Grease	SAE Multi-Purpose	High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base	As Required Unless Otherwise Specified.	---
		High Temperature Extreme Pressure (EP) Performance With 10% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base	Driveline Slip-Joints	
Gear Lubricant	Traxon LS 80W90*	High Thermal and Oxidation Stability. API Service Class GL-5	Cutterbar	3.37 quarts US (3.25 liters)
	Traxon E 75W90*	Fully Synthetic Lubricant API Service Class GL-5	Bevel Gearbox	13.50 oz (400 ml)

* or equivalent

7.3.3 Conversion Chart

QUANTITY	INCH-POUND UNITS		FACTOR	SI UNITS (METRIC)	
	UNIT NAME	ABBR.		UNIT NAME	ABBR.
Area	acres	acres	x 0.4047 =	hectares	ha
Flow	gallons per minute (US) gallons per minute (Imp)	gpm (US) gpm	x 3.7854 = x 4.5460 =	liters per minute	L/min
Force	pounds force	lbf	x 4.4482 =	Newtons	N
Length	inch	in.	x 25.4 =	millimeters	mm
	foot	ft	x 0.305 =	meters	m
Power	horsepower	hp	x 0.7457 =	kilowatts	kW
Pressure	pounds per square inch	psi	x 6.8948 =	kilopascals	kPa
			x .00689 =	megapascals	MPa
Torque	pound feet or foot pounds	lbf·ft or ft·lbf	x 1.3558 =	newton meters	N·m
	pound inches or inch pounds	lbf·in. or in·lbf	x 0.1129 =		
Temperature	degrees Fahrenheit	˚F	(˚F - 32) x 0.56 =	Celsius	˚C
Velocity	feet per minute	ft/min	x 0.3048 =	meters per minute	m/min
	feet per second	ft/s	x 0.3048 =	meters per second	m/s
	miles per hour	mph	x 1.6063 =	kilometers per hour	km/h
Volume	ounces	oz.	x 29.5735 =	milliliters	ml
	cubic inches	$in.^3$	x 16.3871 =	cubic centimeters	cm^3 or cc
	quarts (US) quarts (Imperial)	US qt. qt.	x 0.96464 x 1.1365	liters	L
	gallons (US) gallons (Imperial)	US gal. gal.	x 3.7854 = x 4.5460 =		
Weight	pounds	lb	x 0.4536 =	kilograms	kg

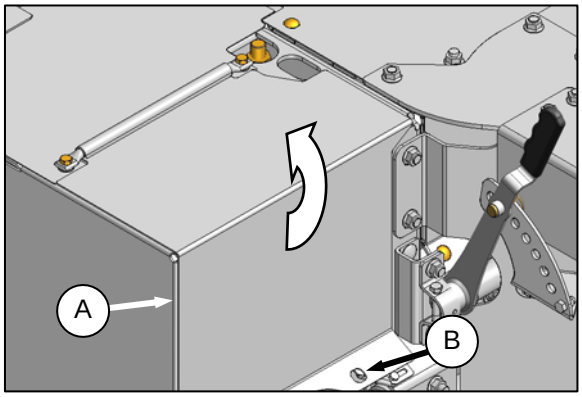
7.4 HEADER LIFT CYLINDER LOCKS

Refer to your MacDon Self-Propelled Windrower Operator's Manual for details on the header lift cylinder locks.

7.5 DRIVESHIELD

WARNING

Do not operate the machine with the driveshields open. High speed rotating components may throw debris, and could result in death or serious injury.



a. To open the driveshield (A), rotate fastener (B) ¼ turn, and lift shield to "open" position.

NOTE

Fastener is spring-loaded, and should return to original position.

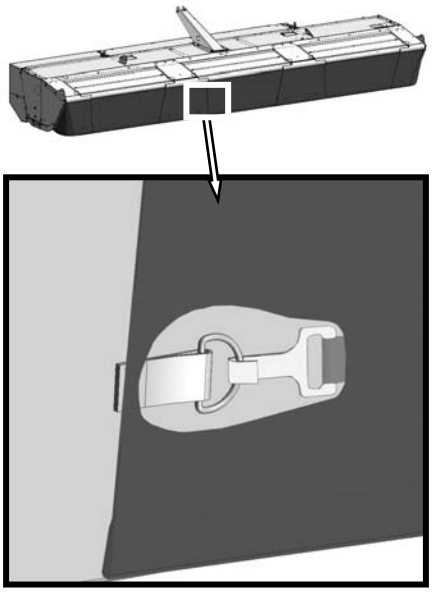
b. To close, lower shield, and fastener will self-latch.

7.6 CUTTERBAR DOORS

WARNING

Do not operate the machine without all the cutterbar doors down, curtains installed and in good condition.

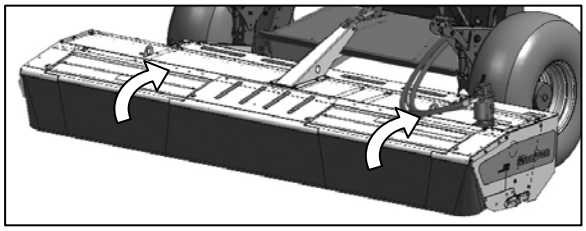
There are two doors to provide access to the cutterbar area. Rubber curtains are attached to each door, and at the front corners and center fixed cover.



Latches at the lower corners of the curtains keep the curtains together, and minimize the risk of thrown objects.

The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down and latched when operating the mower conditioner.

Replace the curtains if they should become worn or damaged. Refer to your Dealer or the Technical Service Manual for replacement instructions.



a. To open door: unhook latches, and lift at front of door.

b. To close door: pull at top, and move to "closed" position. Hook latches.

CAUTION

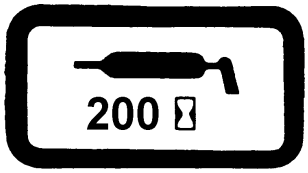
To avoid injury, keep hands and finger away from corners of doors when closing.

7.7 LUBRICATION

WARNING

To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 7.1 PREPARATION FOR SERVICING.

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation.



Log hours of operation and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.11 MAINTENANCE SCHEDULE.

7.7.1 Greasing Procedure

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

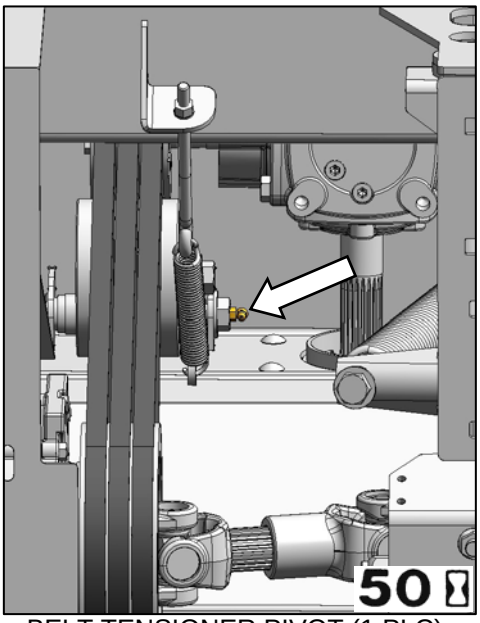
a. Use the recommended lubricants specified in this manual. See Section 7.3.2 Recommended Lubricants.
b. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
c. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
d. Leave excess grease on fitting to keep out dirt.
e. Replace any loose or broken fittings immediately.
f. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

7.7.2 Greasing Points

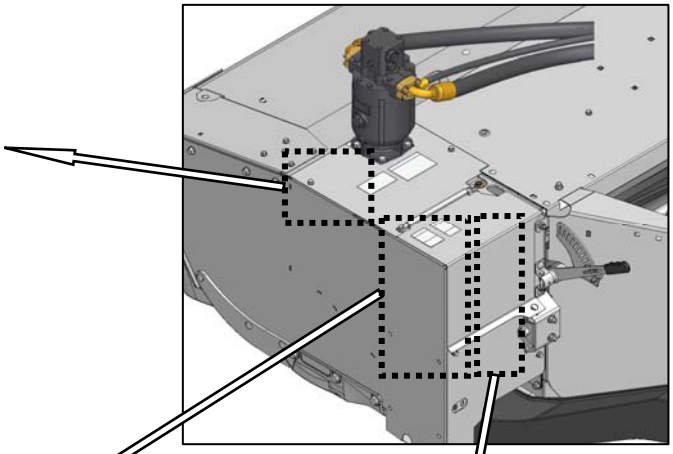
Refer to the illustrations on the following pages to identify the various locations that require lubrication.

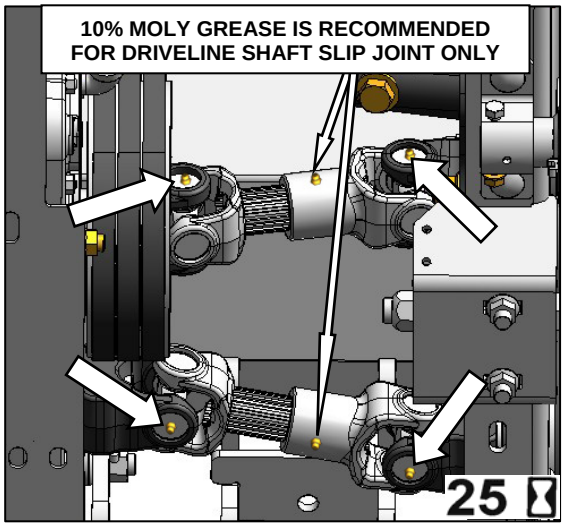
Greasing Points (Cont'd)

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base

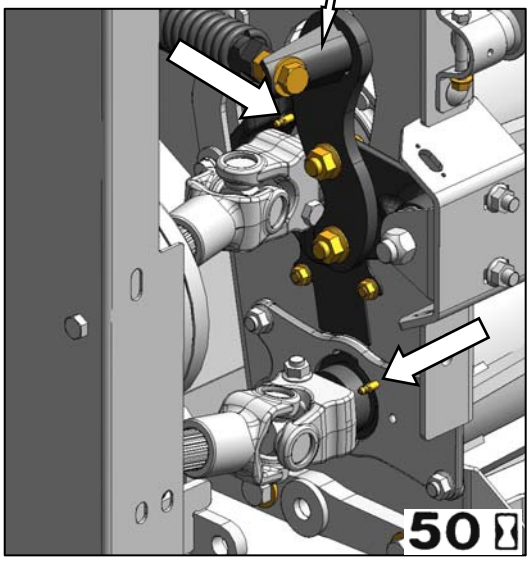


BELT TENSIONER PIVOT (1 PLC)





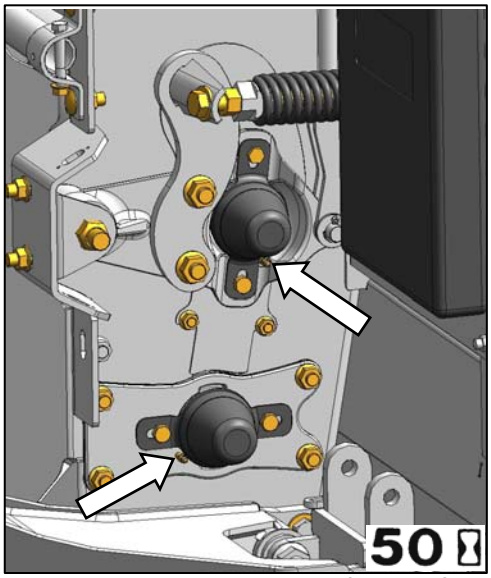
DRIVELINE UNIVERSALS (4 PLCS)
DRIVELINE SHAFT (2 PLCS)



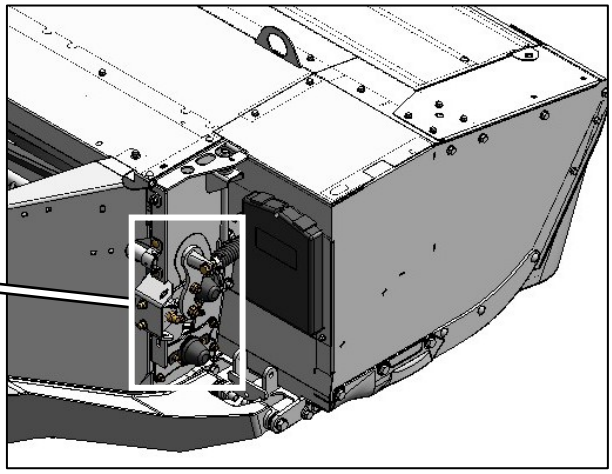
ROLL SHAFT BEARINGS (2 PLCS)

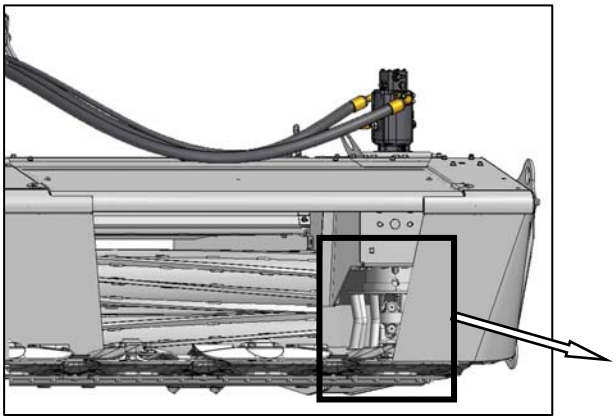
Greasing Points (cont'd)

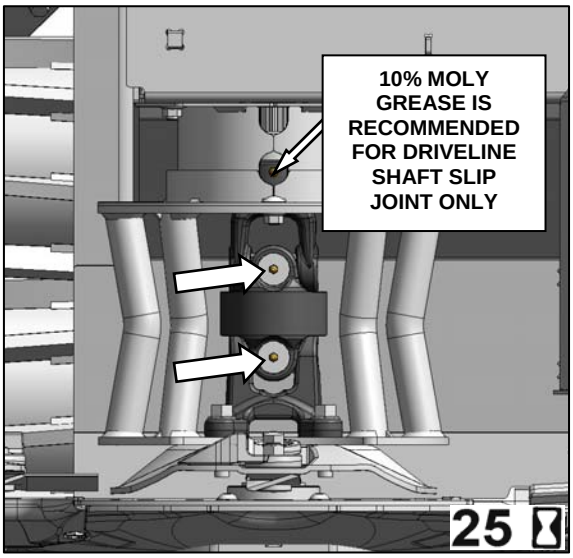
High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base



ROLL SHAFT BEARINGS (2 PLCS)

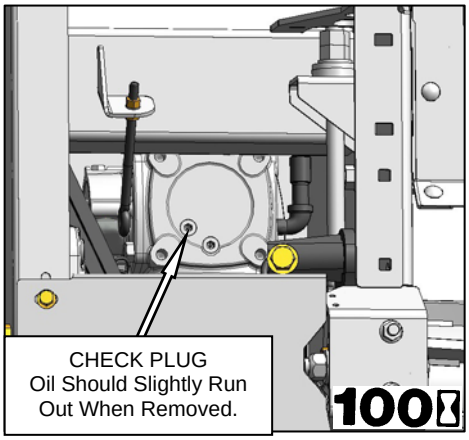




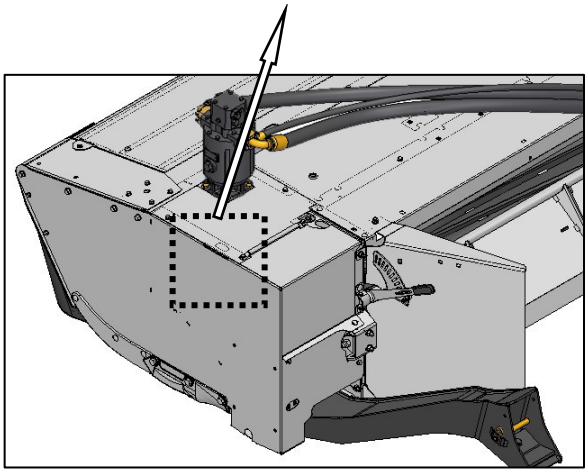


DRIVELINE UNIVERSALS (2 PLCS)
DRIVESHAFT (1 PLC)

7.7.3 Lubricant Level

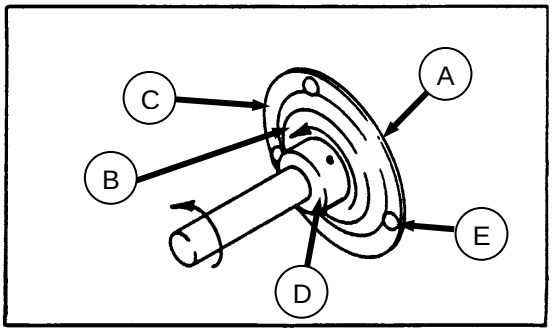


GEARBOX LUBRICANT LEVEL
(CHECK WITH TOP OF HEADER HORIZONTAL)



7.7.4 Sealed Bearing Installation

a. Clean shaft and coat with rust preventative.



b. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

NOTE

The locking cam is only on one side of the bearing.

c. Install (but do not tighten) the flangette bolts (E).

d. When the shaft is correctly located, lock the lock collar with a punch.

NOTE

The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.

e. Tighten the flangette bolts.

f. Loosen the flangette bolts on the mating bearing one turn, and re-tighten. This will allow the bearing to “line up”.

7.8 CUTTERBAR

7.8.1 Cutter Bar Lubrication

The lubricant level in the cutterbar cannot be checked. If in doubt as to the quantity of lubricant in the cutterbar, do not add lubricant. Drain the cutterbar and refill with new clean lubricant as follows:

IMPORTANT

Drain the cutterbar when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

CAUTION

Exercise caution when working around the blades. Blades are sharp, and can cause serious injury. Wear gloves when handling blades.

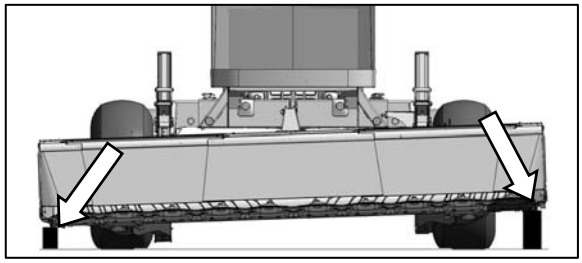
7.8.1.1 Draining

a. Park the machine on level ground, raise header fully, stop engine, and remove key.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage header lift cylinder stops before going under machine for any reason.

b. Engage header lift cylinder locks.



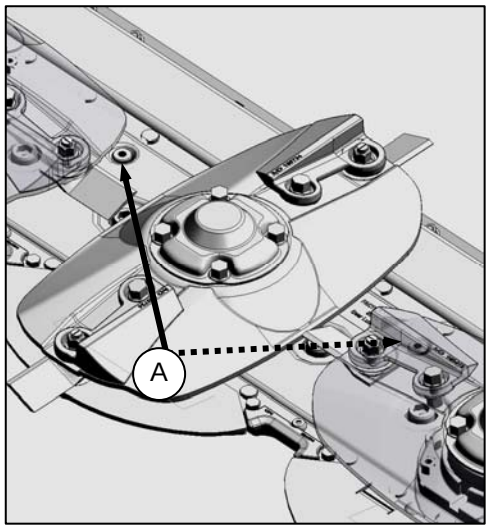
c. Place a block under each end of the header.

NOTE

The block under the left end of the header should be higher than the right end.

d. Disengage the header lift cylinder locks, start windrower, and lower header onto blocks. Shutdown windrower, and remove key.

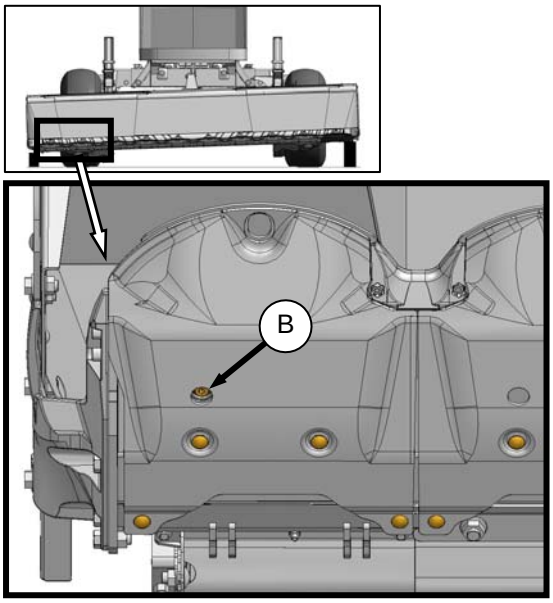
e. Open cutterbar RH door.



f. Clean around either filler (A), and remove plug with an 8 mm hex L-Key.

NOTE

Rotate disc to expose filler if necessary.



g. Place a suitably sized container under the cutterbar drain hole (B).

h. Remove plug (B) with an 8 mm hex L-Key, and allow sufficient time for lubricant to drain.

IMPORTANT

Do not flush the cutterbar.

i. Replace drain plug (B), and tighten.

j. Safely dispose of lubricant.

7.8.1.2 Filling

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage header lift cylinder stops before going under machine for any reason.

CAUTION

Never start or move the machine until you are sure all bystanders have cleared the area.

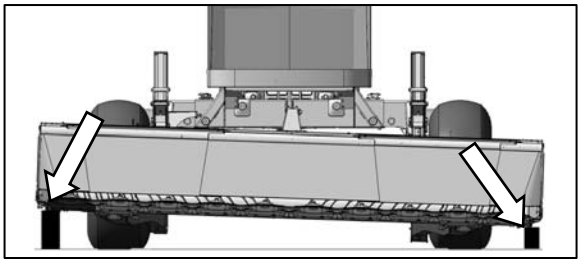
a. Start engine, and raise header. Stop engine, and engage header lift cylinder lock-outs.

b. Move higher block to right end of header, and remove used lubricant container.

NOTE

Having the fill end higher allows for quicker filling of cutterbar.

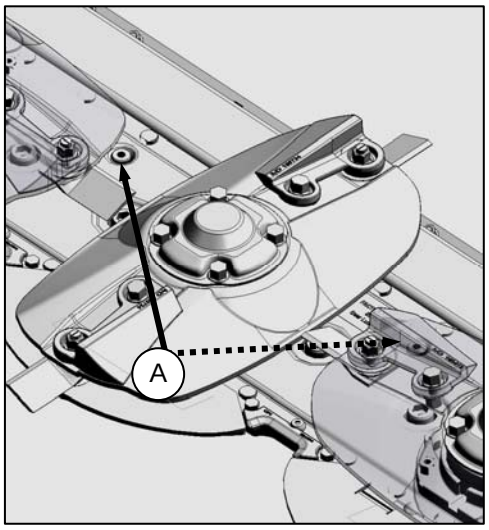
c. Disengage header lift cylinder lock-outs.



d. Start engine, and lower header onto blocks. Stop engine, and remove key.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



e. Remove filler plug at either location (A).

f. Add exactly 3.37 quarts US (3.25 liters) of Traxon SAE 80W90 lubricant through filler hole (A).

IMPORTANT

Do not overfill the cutterbar. Overfilling can cause overheating, and damage to or failure of cutterbar will occur.

g. Replace filler plug (A).

h. Close cutterbar doors.

i. Start engine, and raise header.

j. Stop engine, and engage header lift cylinder lock-outs.

k. Remove blocks.

7.8.2 Rock Guards

The R85 is equipped with a rock guard at each cutting disc location. The rock guard prevents the cutterbar from digging into the ground, and protects the disc from coming in contact with stones and other debris.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage header lift cylinder stops before going under machine for any reason.

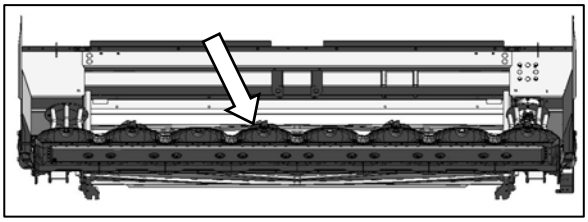
CAUTION

Exercise caution when working around the blades. Blades are sharp, and can cause serious injury. Wear gloves when handling blades.

Check rock guards periodically for severe damage or wear as follows:

a. Raise header fully, stop engine, and remove key.

b. Engage header lift cylinder locks.



c. Inspect rock guards for severe damage, wear, and distortion. The guards should be replaced if severely damaged or worn.

d. Check for loose or missing fasteners, and tighten or replace fastener if missing.

e. See the Technical Manual or your MacDon Dealer for replacement procedures.

7.8.3 Disc Maintenance

Check daily that discs are not damaged by rocks or worn excessively from abrasive working conditions.

They are interchangeable, and a disc can be moved to a spindle that rotates in the opposite direction, as long as it is in a useable condition.

The discs are <u>not</u> repairable, and must be replaced if severely damaged or worn.

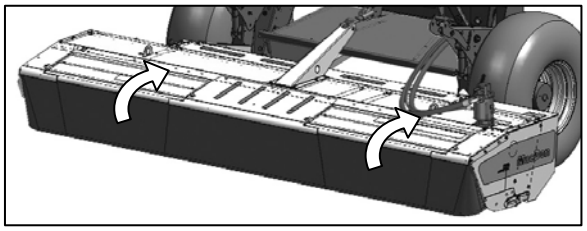
IMPORTANT

If holes appear in a disc, replace the disc immediately. Do not attempt to repair the discs. Always use factory replacement parts.

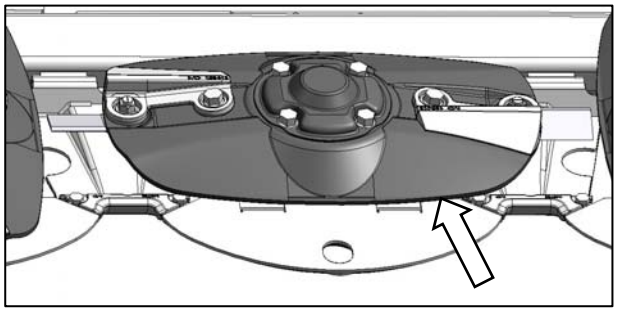
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shut off engine and remove key.



b. Open cutterbar doors.



c. Check discs for damage or loose fasteners.

d. Replace damaged discs. Refer to following section.

e. Replace damaged fasteners. Tighten loose fasteners.

f. Close cutterbar doors.

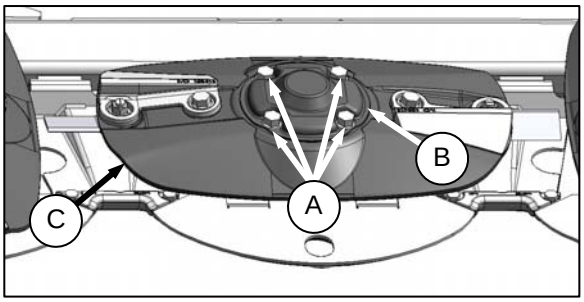
7.8.3.1 Disc Removal/Installation

CAUTION

Exercise caution when working around the blades. Blades are sharp, and can cause serious injury. Wear gloves when handling blades.

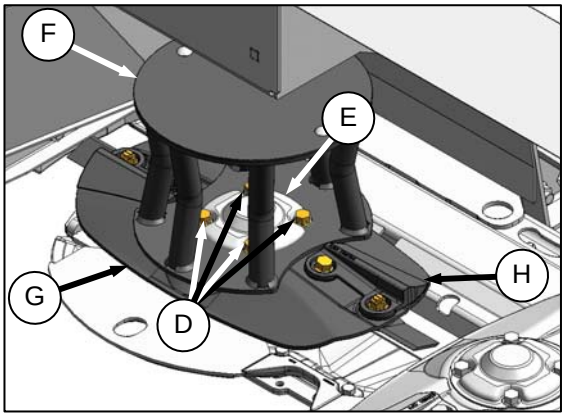
a. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.

b. Replacing a disc:



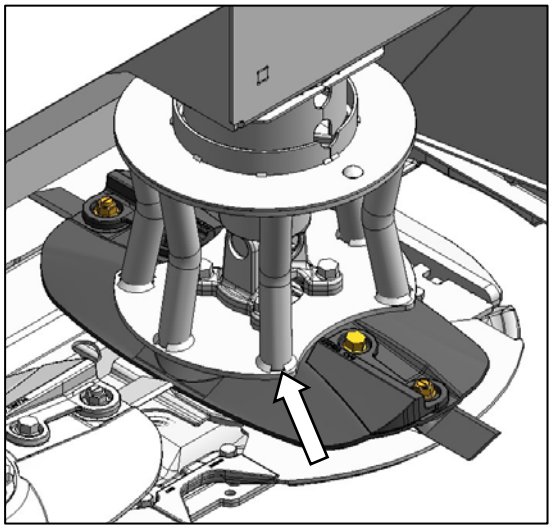
1. Remove four bolts (A) on disc cover (B), and remove cover and disc (C).
2. Position new disc (C) on spindle ensuring it is 90 degrees to the adjacent discs.
3. Install cover (B), and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

c. Replacing disc under driven deflector:



1. Remove four bolts (D).
2. Remove cover (E), deflector (F), and disc (G).
3. Position new disc (G) on spindle, ensuring it is 90 degrees to adjacent discs.
4. Position deflector (F) on spindle so that it clears accelerators (H).
5. Install cover (E), and secure with four bolts (D). Tighten bolts to 92 ft·lbf (125 N·m).

d. Replacing the driveline disc:



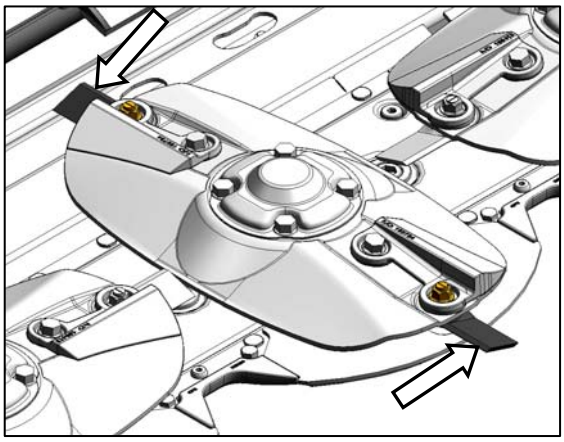
Refer to the Technical Service Manual.

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

e. Close doors.

7.8.4 Cutter Blades



Each disc has two cutter blades attached to either end, and are free to swivel horizontally on a specially designed shoulder bolt.

The blade, with two cutting edges, can be flipped over so that the blade does not need to be replaced as often.

The blades are not repairable, and must be replaced if severely damaged or worn.

IMPORTANT

Always use factory replacement parts.

7.8.4.1 Inspection

CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp, and can cause serious injury. Wear gloves when handling blades.

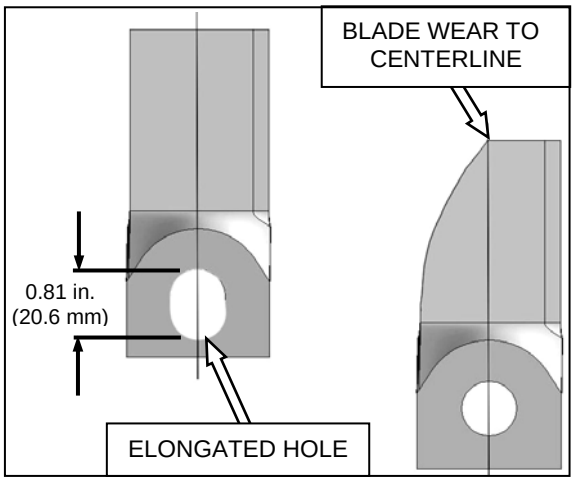
CAUTION

Damaged blades may damage the cutterbar, and result in poor cutting performance. Replace damaged blades at earliest possible opportunity.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Check daily that the cutter blades are securely attached to the disc.

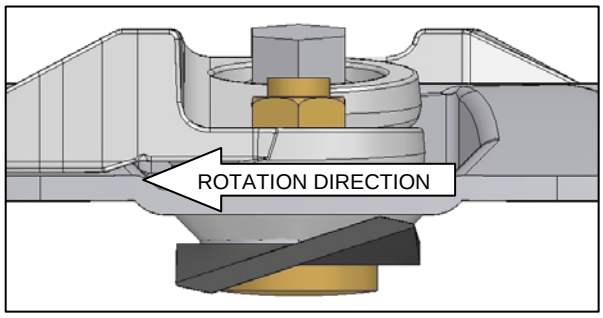


b. Check blades for cracks, wear beyond safe operating limits, and distortion.

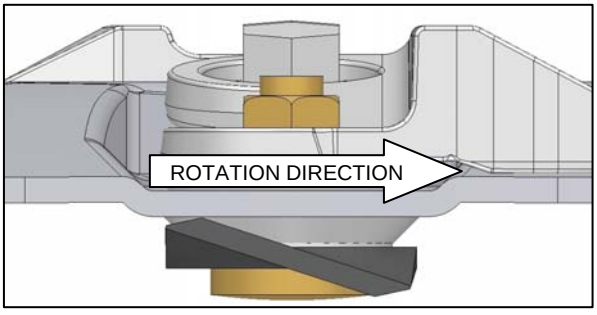
c. Replace blades immediately if any of these problems occur.

IMPORTANT

Blades should be replaced in pairs, otherwise the disc may be unbalanced, and damage the cutterbar.



CLOCKWISE DISC



COUNTER CLOCKWISE DISC

IMPORTANT

The cutter blades have cutting edges on both edges so that the blade can be turned over and re-used. The twist in each blade determines if its cutting direction is clockwise or counter clockwise.

7.8.4.2 Replacement

CAUTION

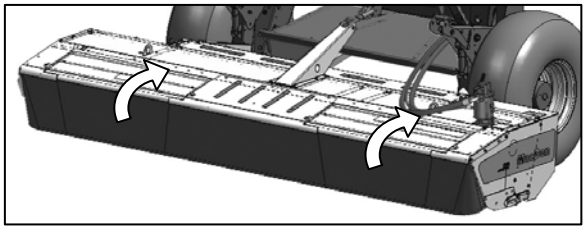
Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp, and can cause serious injury. Wear gloves when handling blades.

DANGER

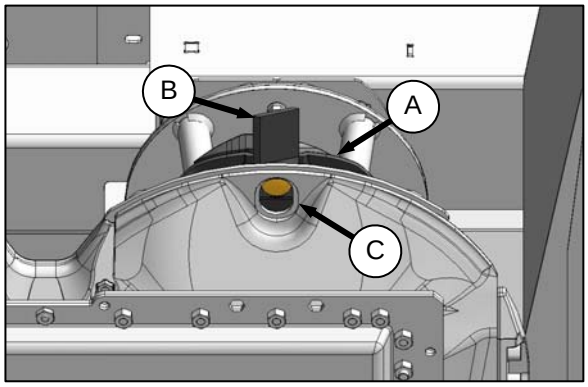
To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage lift cylinder lock-out valves before going under machine for any reason.

a. Raise header fully, shut off engine, and remove key.

b. Engage lift cylinder lock-out valves.



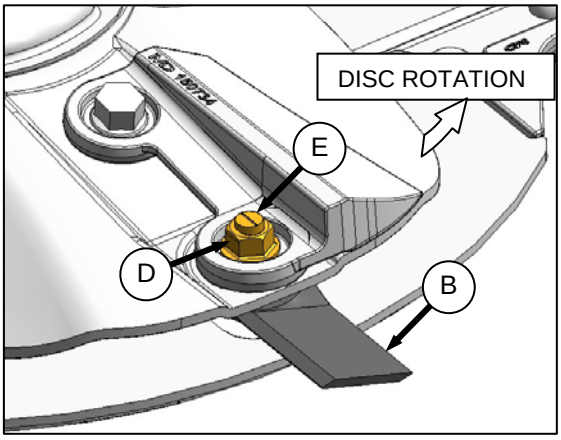
c. Open cutterbar door(s).



d. Rotate disc (A) so that blade (B) faces "forward", and "lines up" with hole (C) in rock guard.

e. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.

f. Clean debris from blade attachment area.



g. Remove nut (D).

h. Remove shoulder bolt (E), and blade (B).

i. Install new or reversed blade (B) with shoulder bolt (E) onto disc.

j. Install nut (D). Tighten nut to 100 ft·lbf (135 N·m).

k. Remove block of wood (if used).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

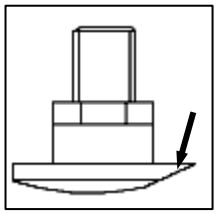
l. Close doors.

7.8.4.3 Cutter Blade Hardware

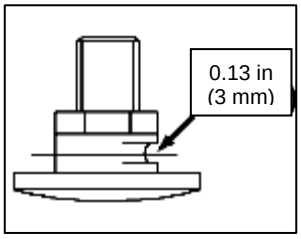
Check blade attachment hardware each time blades are changed. Refer to previous section for hardware replacement procedure.

a. Check bolts for wear or damage, and replace bolt if any of the following conditions occur:

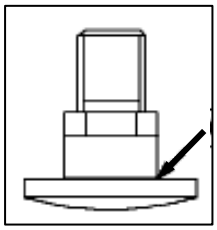
1. Bolt has been removed and installed five times.



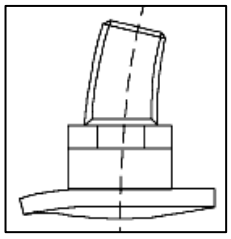
2. Head is worn flush with bearing surface of blade.



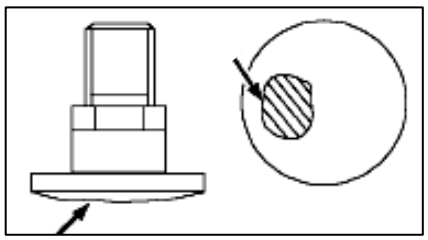
3. Diameter of bolt neck is worn out of specification.



4. Bolt is cracked.

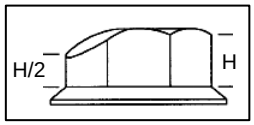


5. Bolt is visibly distorted.



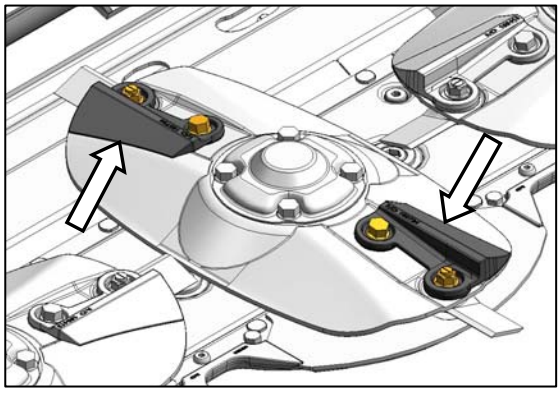
6. Evidence of interference with adjacent parts.

b. Check nuts for wear or damage, and replace nut if:



- Worn height is less than half total height.
- Cracked.
- Nut has been removed and installed five times.

7.8.5 Accelerators



Two accelerators are mounted on each disc, and are designed to quickly move the cut material off the disc and into the auger and conditioner.

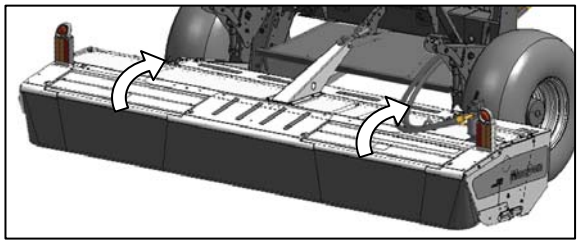
They are replaceable, and should be periodically inspected for damage and loose or missing fasteners.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Raise header fully, stop engine, and remove key.

b. Engage header lift cylinder locks.



c. Open cutterbar doors.

CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

d. Inspect accelerators for damage and wear. They should be replaced if severely damaged or worn.

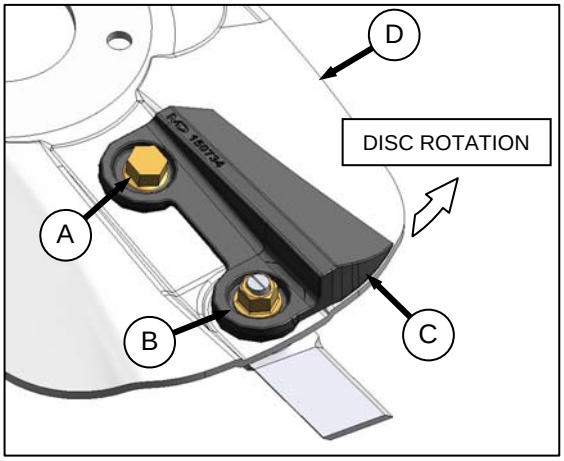
e. Check for loose or missing fasteners, and tighten or replace fastener if missing.

7.8.5.1 Replacing Accelerators

a. Raise header fully, shut off engine, and remove key.

b. Engage lift cylinder lock-out valves.

c. Remove disc. See Section 7.8.3.1 Disc Removal/Installation.



d. Remove bolt and nut (A), and nut (B) and remove accelerator (C) from disc (D).

IMPORTANT

Do not remove cutter blade bolt unless it or the blade are being replaced. Repeat for other accelerator.

e. Locate new accelerator on disc onto existing cutter blade bolt. Install nut (B).

NOTE

Accelerators are handed for clockwise or counter clockwise operation. Verify the direction of disc before installing accelerators.

f. Install hex bolt (A) and nut at inboard hole. Bolt head faces “up”.

g. Tighten both nuts to 100 ft·lbf (135 N·m).

h. Repeat for other accelerator.

i. Re-install disc (D) on spindle. Refer to Section 7.8.3.1 Disc Removal/Installation.

j. Remove block of wood (if used).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

k. Close cutterbar doors.

7.8.6 Rotary Deflectors

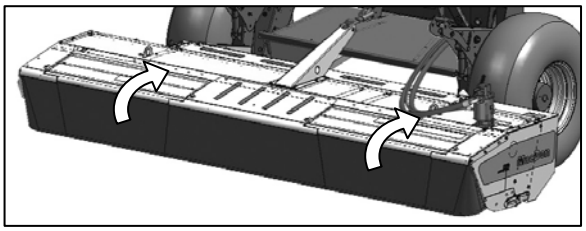
The rotary converging cage deflectors are designed to deliver the cut material from the ends of the cutterbar into the auger, and to assist in maintaining the even flow of crop into the conditioner.

They should be checked daily for damage or wear.

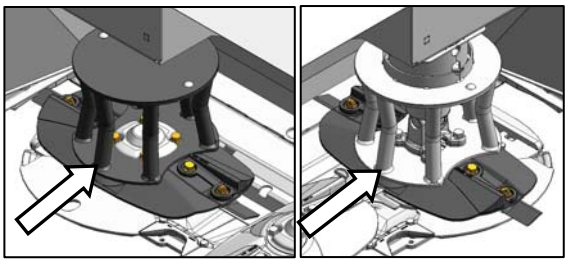
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shut off engine, and remove key.



b. Open cutterbar doors.



c. Check that deflectors are not damaged or bent by rocks, and for loose fasteners.

d. Replace deflectors if they are severely damaged or worn. See next section. Do not repair.

e. Tighten loose fasteners.

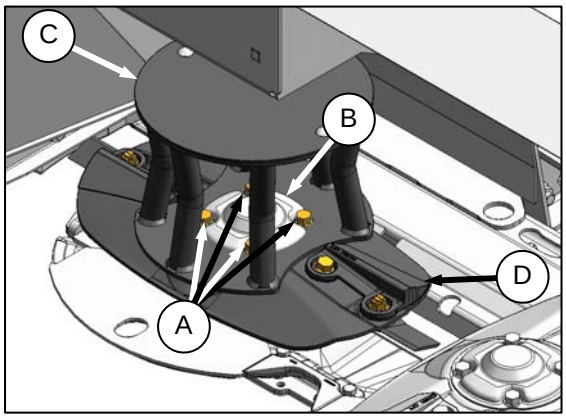
WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

f. Close cutterbar doors.

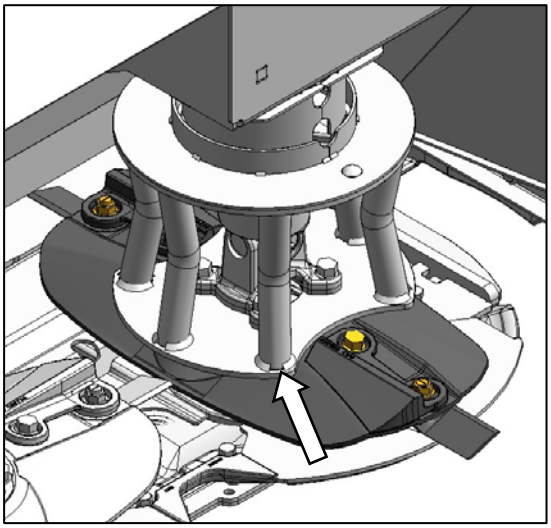
7.8.6.1 Deflector Removal/Installation

a. To replace driven deflector:



1. Remove four bolts (A).
2. Remove cover (B) and deflector (C).
3. Position new deflector (C) on spindle so that it clears accelerators (D).
4. Install cover (B), and secure with four bolts (A).
5. Tighten bolts to 92 ft·lbf (125 N·m).
6. Close cutterbar doors.

b. To replace driveline deflector:



Refer to the Technical Service Manual or your MacDon Dealer.

7.9 DRIVES

7.9.1 Conditioner Drive Belt

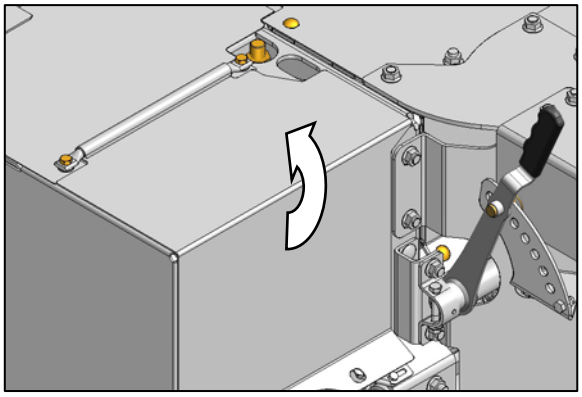
The conditioner drive belt (A) is located inside the drive compartment at the left hand side of the header, and is tensioned with a spring tensioner. The tension is factory-set, so should not require adjusting.

Check the belt tension, and inspect for damage or wear every 100 hours or annually, preferably before the start of the cutting season.

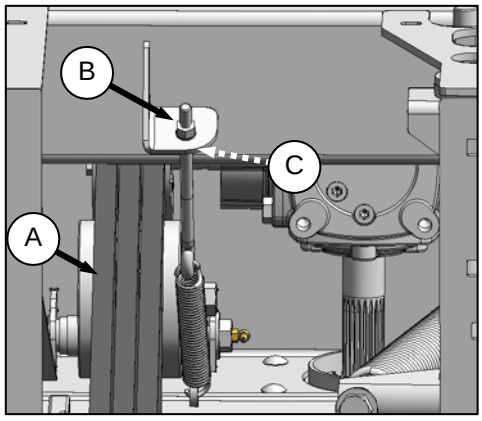
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

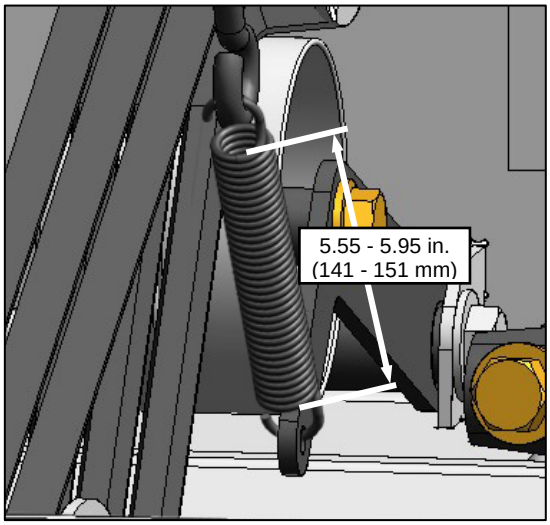
a. Lower header to ground, turn off engine, and remove key.



b. Open the driveshield. See Section 7.5 DRIVESHIELD.



c. Check that adjuster nuts (B) and (C) are tight.



d. The tensioner spring should measure approximately 5.55 - 5.95 in. (141 - 151 mm) in length when properly tensioned.

e. If necessary, adjust tension as follows:
   1. Loosen jam-nut (C).
   2. Turn nut (B):
      - clockwise to increase spring length (tension), or
      - counter clockwise to decrease length (loosen).
   3. Tighten jam-nut (C).

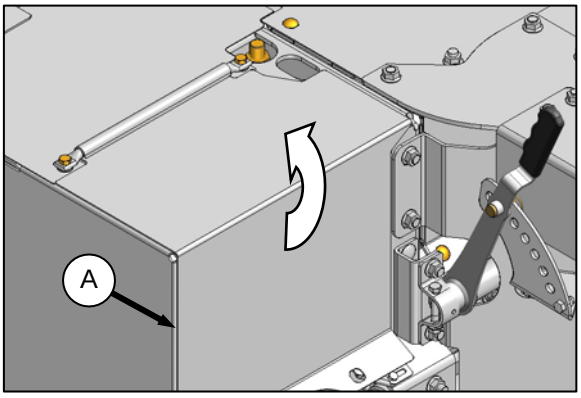
f. Close driveshield.

7.9.1.1 Replacing Conditioner Drive Belt

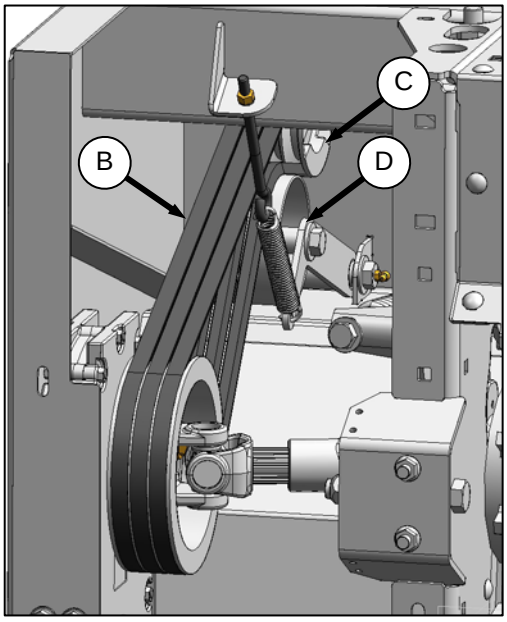
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, turn off engine, and remove key.

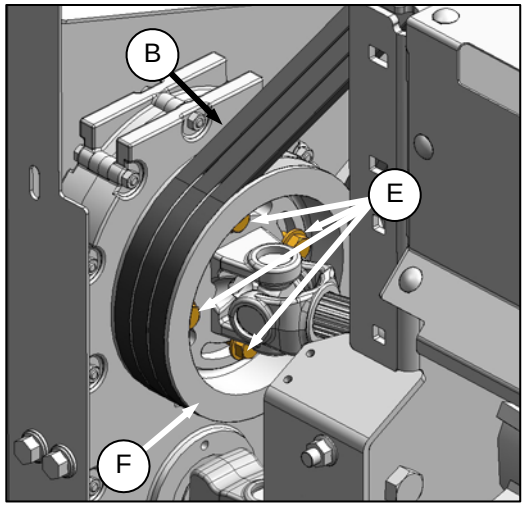


b. Open the driveshield. See Section 7.5 DRIVESHIELD. Lower shield (A) can also be removed to ease access to drive compartment.



c. Release tension on conditioner drive belt (B). See previous section.

d. Remove conditioner drive belt (B) from drive pulley (C). Tensioner (D) can be forced away from belt to ease removal.



e. Remove the four bolts (E), and washers attaching upper driveline to driven pulley (F), and slide driveline away from pulley.

f. Remove drive belt (B) from driven pulley.

IMPORTANT

Change all three bolts when replacing, as they are a matched set.

g. Install new belt (B) onto driven pulley (F) first, and then onto drive pulley (C), ensuring they are in the pulley grooves.

h. Tension belt (B). See previous section.

i. Re-attach upper driveline to driven pulley with bolts (E) and washers. Check roll timing before fully tightening bolts. See Section 6.10.4 Roll Timing.

j. Torque bolts to 75 lbf·ft (102 N·m).

k. Re-install lower driveshield (A).

l. Close driveshield.

7.9.2 Conditioner Gearbox

The conditioner gearbox, which transfers power from the bevel gearbox to the conditioner rolls and to the overshot auger, is located inside the drive compartment at the left end of the header.

The gearbox does not require normal maintenance or servicing.

If repairs are required, it should be removed and serviced at your Dealer. See your MacDon Dealer or Technical Service Manual.

7.9.3 Bevel Gearbox

The bevel gearbox, which transfers power from the hydraulic motor to the header drives, is located inside the drive compartment at the left end of the header.

If repairs are required, it should be removed and serviced at your Dealer. See your MacDon Dealer or Technical Service Manual.

The only regular servicing required is maintaining the lubricant level, and changing the lubricant according the intervals specified in this manual.

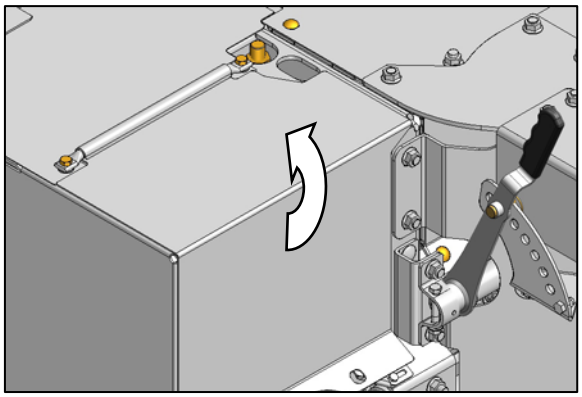
7.9.3.1 Changing Lubricant

DANGER

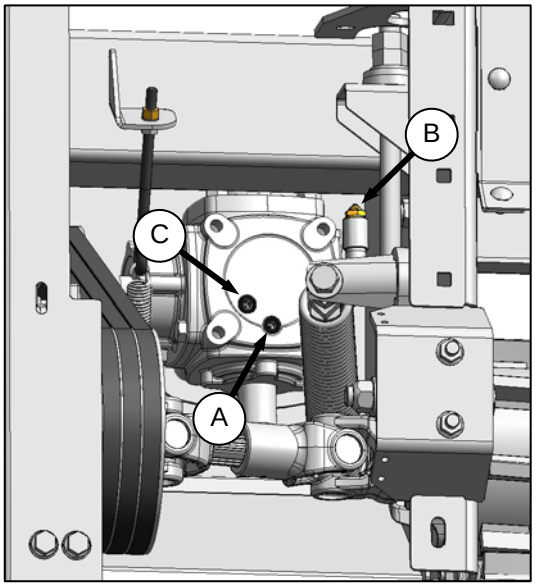
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

b. Raise header to full height, and engage header lift cylinder locks. Stop engine, and remove key.



c. Open the driveshield. See Section 7.5 DRIVESHIELD.



d. Place a suitable container under drain plug (A).

e. Remove plug (A).

f. Allow sufficient time for lubricant to drain.

g. Disengage header lift cylinder locks, start engine, and lower header so that it is level. Stop engine, and remove key.

h. Remove breather and bushing from filler elbow (B) and plug (C).

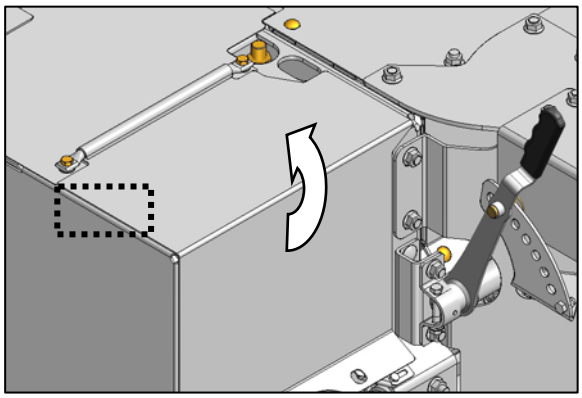
i. Add 13.5 oz. (400 ml) of Traxon E 75W90 gear lubricant to gearbox through elbow (B). Lubricant should slightly run out of port (C) when at the proper level.

j. Replace plug (C), bushing and breather (B), and tighten.

k. Properly dispose of used lubricant, and clean up any spilled lubricant.

l. Lower driveshield.

7.9.4 Gearbox Speed Sensor



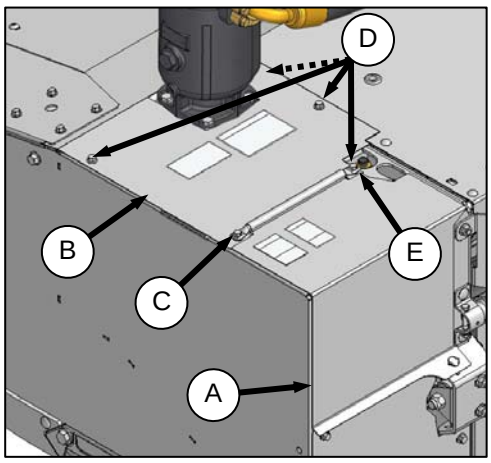
The gearbox speed sender monitors the rotational speed of the gearbox output shaft, and sends a signal to the systems monitor in the Operator's station, that is displayed as disc speed.

The sensor does not require regular maintenance, and if it malfunctions or is damaged, it can be easily adjusted or replaced.

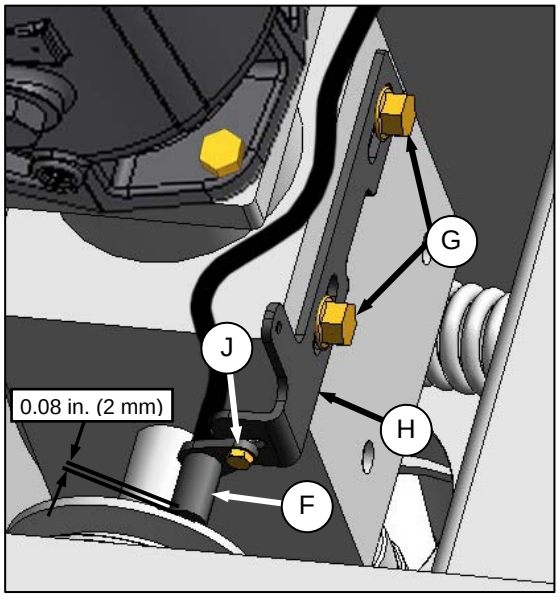
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, turn off engine, and remove key.



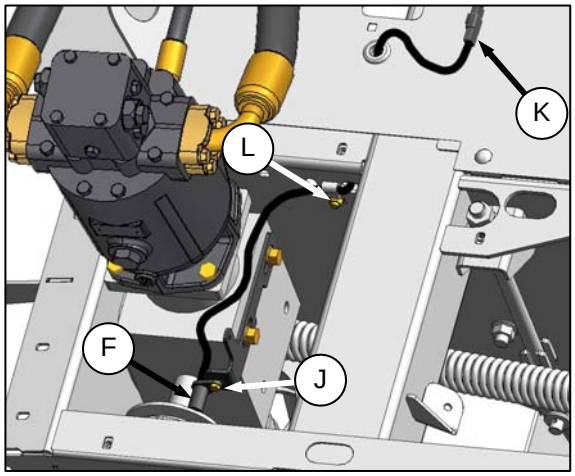
b. Remove shield (A) and cover (B) as follows:
   1. Open shield (A).
   2. Remove bolt (C), washer and nut from LH hinge.
   3. Pull shield (A) off of the other hinge.
   4. Remove four bolts (D) and hinge (E).
   5. Slide and lift cover (B) away from motor to remove it.



c. Check gap between sensor (F) and pulley. If required, adjust gap by loosening bolts (G), and moving bracket (H) to achieve 0.08 in. (2 mm) gap. Tighten bolts.

d. Check position of sensor. If required, adjust position by loosening bolt (J), and moving sensor to align it with rim of pulley.

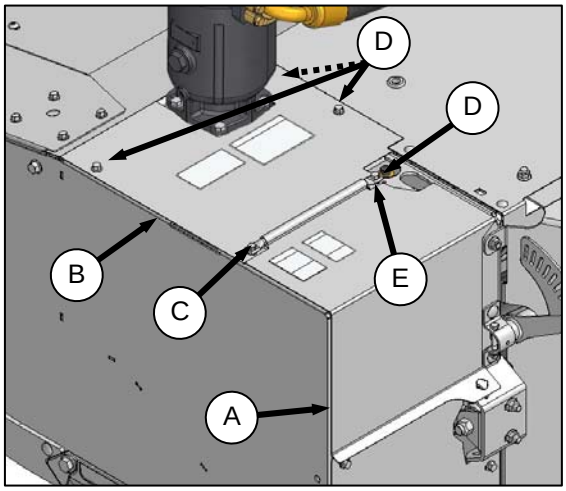
e. Remove and install the sensor as follows:



1. Disconnect sensor wire from header wiring harness at connector (K).
2. Remove bolt through clip (L).
3. Pull harness through grommet, and into drive compartment.
4. Remove nut and bolt (J) securing sensor (F) to bracket, and remove sensor.

(continued next page)

5. Install new sensor (F) onto bracket with bolt (J) and nut. Ensure sensor is aligned with pulley rim.
6. Check gap between sensor and pulley is 0.08 in. (2 mm), and adjust as required.
7. Route connector and harness through hole in frame, and through grommet in cover.
8. Connect sensor wiring to existing connector (K).



f. Re-install cover (B) and shield (A) as follows:
   1. Position cover (B) over opening, and install four bolts (D) and nuts, and hinge (E). Washer goes between hinge (E) and frame.
   2. Slide shield (A) onto hinge (E), and attach other hinge with bolt (C), washer, and nut. Washer goes between hinge and frame.

g. Close shield.

7.10 HYDRAULICS

Refer to your MacDon Self-Propelled Windrower Operator's Manual for hydraulic system maintenance procedures for self-propelled windrowers.

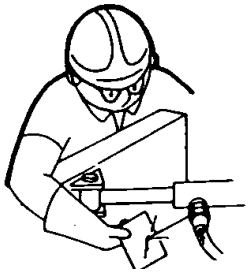
7.10.1 Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury.**

- **Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin- holes and nozzles which eject fluids under high pressure.**
- **If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.**



- **Use a piece of cardboard or paper to search for leaks.**

IMPORTANT

Keep hydraulic coupler tips and connectors clean. Dust, dirt, water and foreign material are the major causes of hydraulic system damage.

DO NOT attempt to service hydraulic system in the field.

Precision fits require WHITE ROOM CARE during overhaul.

7.10.2 Hydraulic Motor

The hydraulic drive motor does not require any maintenance.

If repairs are required, it should be removed and serviced at your MacDon Dealer.

Refer to the Technical Service Manual for removal and installation procedures.

7.11 MAINTENANCE SCHEDULE

The following maintenance schedule lists the periodic maintenance procedures, organized by service intervals.

Regular maintenance is the best insurance against early wear and untimely breakdowns.

Following this schedule will increase machine life. For detailed instructions, refer to the specific headings in Section 7 MAINTENANCE AND SERVICING. Use the fluids and lubricants specified in Section 7.3.2 Recommended Lubricants.

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one timeframe, e.g. "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT

Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

CAUTION

Carefully follow safety messages given under Section 7.2 RECOMMENDED SAFETY PROCEDURES.

7.11.1 Break-In Inspection

HOURS	ITEM	INSPECTION	SECTION
5	Drive Belt	Check Tension.	7.9.1
	Hardware	Check For Loose Hardware. Tighten To Required Torque.	7.3.1
25	Drive Belt	Check Tension.	7.9.1
50	Drive Belt	Check Tension.	7.9.1
	Cutterbar Lubricant	Change. **Use Only Specified Amount. Do Not Overfill.**	7.8.1
	Bevel Gearbox Lubricant	Change.	7.9.3
150	Bevel Gearbox Lubricant	Change.	7.9.3
	Cutterbar Lubricant	Change. **Use Only Specified Amount. Do Not Overfill.**	7.8.1

7.11.2 Interval Maintenance

INTERVAL	SERVICE	SECTION
FIRST USE	Refer To 7.11.1 Break-In Inspection (previous page).	7.11.1
100 HOURS OR ANNUALLY *	1. Check Bevel Gearbox Lubricant Level. 2. Check Conditioner Drive Belt Tension.	7.9.3 7.9.1
END OF SEASON	Refer To Section 6.13 STORAGE.	6.13
10 HOURS OR DAILY	1. Check Hydraulic Hoses And Lines For Leaks. 2. Check Cutter Blades For Security And Condition. 3. Check Rotary Converging Cage Deflectors For Security And Condition.	--- 7.8.4 7.8.6
25 HOURS	1. Grease Cutterbar Driveline Universal Shaft. 2. Grease Roll Universal Shafts.	7.7.2
50 HOURS	1. Grease Roll Shaft Bearings. 2. Grease Drive Belt Tensioner.	7.7.2
250 HOURS	1. Change Bevel Gearbox Lubricant. 2. Change Cutterbar Lubricant. Use only specified amount. Do not overfill.	7.9.3 7.8.1

*** IT IS RECOMMENDED THAT ANNUAL MAINTENANCE BE DONE PRIOR TO START OF OPERATING SEASON.**

7.11.3 Maintenance Record

ACTION:	✓ - Check	♦ - Lubricate	▲ - Change

MAINTENANCE RECORD																					
	Hour Meter Reading																				
	Date																				
	Serviced By																				
FIRST USE		Refer To Section 7.11.1 Break-In Inspection																			
100 HOURS OR ANNUALLY																					
✓	Conditioner Drive Belt																				
✓	Bevel Gearbox Lubricant Level																				
END OF SEASON		Refer To Section 6.13 STORAGE																			
10 HOURS OR DAILY		**NOTE: A RECORD OF DAILY MAINTENANCE IS NOT NORMALLY REQUIRED BUT IS AT THE OWNER/OPERATOR'S DISCRETION.**																			
✓	Hydraulic Hoses and Lines																				
✓	Cutter Blades, Deflectors and Discs																				
25 HOURS																					
♦	Roll Universal Shafts																				
♦	Cutterbar Driveline Universals																				
50 HOURS																					
▲	Cutterbar Lube - First 50 & 150 H																				
▲	Bevel Gearbox Lube - First 50 & 150 H																				
♦	Drive Belt Tensioner																				
♦	Roll Shaft Bearings																				
250 HOURS																					
▲	Cutterbar Lubricant																				
▲	Bevel Gearbox Lubricant																				

8 TROUBLESHOOTING

8.1 MOWER PERFORMANCE

SYMPTOM	PROBLEM	SOLUTION	SECTION
Cutterbar Plugging.	Dull, bent, or badly worn blades.	Replace blades.	7.8.4.2
	Build-up of dirt between rock guards.	Decrease header angle, and increase flotation. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	6.10.6 & 6.10.1
	Conditioner drive belt slipping.	Adjust conditioner drive belt tension.	7.9.1
Ragged Or Uneven Cutting Of Crop.	Header angle too flat for guards to pick up down crop.	Increase header angle.	6.10.6
	Downed crop.	Adjust header angle to cut closer to ground.	
	Header flotation too light, causing bouncing.	Adjust to heavier float setting.	6.10.1
	Excessive ground speed.	Reduce ground speed.	6.10.9
Strips Of Uncut Crop Left On Field.	Bent cutter blades.	Replace blades.	7.8.4.2
	Build-up of dirt between rock guards.	Decrease header angle, and increase flotation.	6.10.6 & 6.10.1
	Excessive header speed.	Reduce header disc speed.	6.10.8
	Foreign object on cutterbar.	Disengage header, and stop engine. When all moving parts are completely stopped, remove foreign object.	6.12
	Ground speed too slow.	Increase ground speed.	6.10.9
Conditioner Rolls Plugging.	Ground speed too fast.	Reduce ground speed.	
	Roll gap too large for proper feeding.	Decrease roll gap.	6.10.2
	Roll gap too small in thick stemmed cane-type crops.	Increase roll gap.	
	Baffle set too low.	Raise baffle.	6.10.5.3
	Roll speed too low.	Increase disc speed.	6.10.8
	Foreign object between rolls.	Disengage header, and stop engine. When all moving parts are completely stopped, remove foreign object.	6.12
	Cutting height too low.	Decrease header angle to raise cutting height.	6.10.6

TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Conditioner Rolls Plugging (cont'd).	Backing into windrow.	Raise header before backing up.	---
	Rolls improperly timed.	Adjust roll timing.	6.10.4
Uneven Formation And Bunching Of Windrow.	Rear deflector bypassing or dragging crop.	Adjust rear deflector for proper crop control.	6.10.5.2
	Forming shields improperly adjusted.	Adjust forming shields.	6.10.5
	Roll gap too large.	Adjust roll gap.	6.10.2
	Conditioner rolls running too slow.	Maintain rated header speed.	See Windrower Operator's Manual.
Uneven Windrow Formation In Light Crop.	Uneven feeding.	Reduce header speed.	
Plugging Behind End Hourglass Deflectors.	Ground speed too slow.	Increase ground speed.	
Not Cutting Short Enough In Down Crop.	Ground speed too fast.	Reduce ground speed.	
	Broken, bent or dull blades.	Replace blades or turn blades over.	7.8.4.2
	Cutting height too high.	Adjust header angle to lower cutting height, if field conditions allow.	6.10.6
Material Being Pulled Out By Roots When Cutting Tall Crop Leaning Into Machine.	Crop in conditioner rolls before crop is cut.	Increase roll gap.	6.10.2.1
Damaged Leaves And Broken Stems.	Insufficient roll gap.		
	Roll timing off.	Check roll timing, and adjust if necessary.	6.10.4
Slow Crop Drying.	Crop is bunched in windrow.	Adjust forming shields/baffle.	6.10.5
	Rolls not crimping crop sufficiently.	Decrease roll gap.	6.10.2
Excessive Drying Or Bleaching Of Crop.	Excessive crimping.	Increase roll gap.	
	Crop is spread too wide in windrow.	Adjust forming shields.	6.10.5
Poorly Formed Or Bunchy Windrows.	Forming shields not properly adjusted.		
Cutting Height Varies From One Side To The Other.	Flotation not properly balanced.	Adjust header flotation.	6.10.1

8.2 MECHANICAL

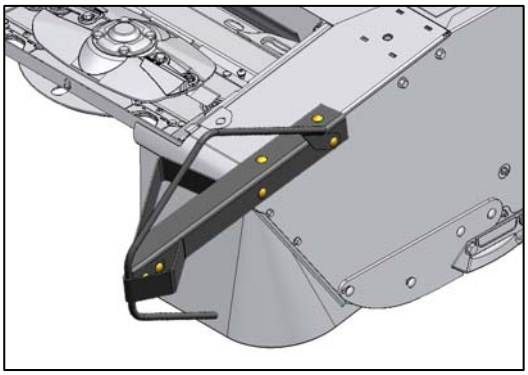
SYMPTOM	PROBLEM	SOLUTION	SECTION
Excessive Noises.	Bent cutter blade.	Replace blade.	7.8.4.2
	Conditioner roll timing off.	Check roll timing, and adjust if necessary.	6.10.4
	Bent cage deflector.	Replace deflector.	7.8.6
	Conditioner roll gap too small.	Check gap, and adjust if necessary.	6.10.2
Excessive Vibration Or Noise In Header.	Conditioner rolls contacting each other.	Increase roll gap.	
		Check roll timing.	6.10.4
	Mud deposits on conditioner rolls.	Clean rolls.	---
Excessive Heat In Cutterbar.	Too much lubricant in cutterbar.	Drain lubricant, and refill with specified amount.	7.8.1
Frequent Blade Damage.	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	---
	Spindle bearing failure.	Replace spindle bearing.	See MacDon Dealer.
	Material wrapped around spindle.	Remove disc, and remove material.	7.8.3
	Cutting too low in rocky field conditions.	Decrease header angle. Increase flotation.	6.10.6 & 6.10.1
	Header float set too heavy.	Increase flotation.	6.10.1
	Ground speed too high in rocky field conditions. Note: high ground speed tends to dig rocks from ground instead of floating over them.	Reduce ground speed.	6.10.9
	Blade incorrectly mounted.	Check all blade mounting hardware to ensure blades are free to move.	7.8.4.3
Excessive Wear Of Cutting Components.	Header angle too steep.	Reduce header angle.	6.10.6
	Crop residue and dirt deposits on cutterbar.	Clean cutterbar.	---
	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	

TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Machine Pulling To One Side.	Header dragging on one end, and pulling to that side.	Adjust header flotation on both ends.	6.10.1
Breakage Of Conditioner Drive Belt.	Improper belt tension.	Adjust conditioner drive belt tension.	7.9.1
	Belt not in proper groove in pulley.	Move belt to proper groove.	7.9.1.1
	Belt pulleys and idlers misaligned.	Align pulleys and idler.	See MacDon Dealer.
	Foreign object between rolls.	Disengage header, and stop engine. When all moving parts are completely stopped, remove foreign object.	---
Discs Don't Turn When Engaging Header.	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	
	Hoses not connected.	Connect hoses.	6.5
	Faulty drive belt.	Check drive belt on pulleys.	7.9.1
	Poor electrical connection at valve.	Check connection at windrower.	See Windrower Operator's Manual.
Header Slows When Going Uphill.	Hydraulic oil level in windrower is low.	Add oil to windrower reservoir.	
Header Runs While Unloaded But Slows Or Stops When Starting To Cut.	Hydraulic oil level in windrower is low.	Add oil to windrower reservoir.	
	Defective hydraulic motor.	Repair/replace hydraulic motor.	See MacDon Dealer.
	Defective hydraulic pump in windrower.	Repair/replace pump.	
	Defective relief valve in windrower.	Repair/replace relief valve.	
	Cold oil in hydraulic drive system.	Reduce ground speed until oil reaches operating temperature.	---

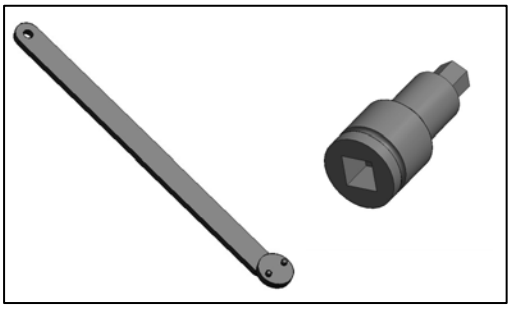
9 OPTIONS AND ATTACHMENTS

9.1 TALL CROP DIVIDER KIT



The tall crop dividers attach to the ends of the header for clean crop dividing and cutterbar entry in tall crops. The kit includes left and right dividers, and attachment hardware.

9.2 CUTTERBAR REPAIR TOOL KIT

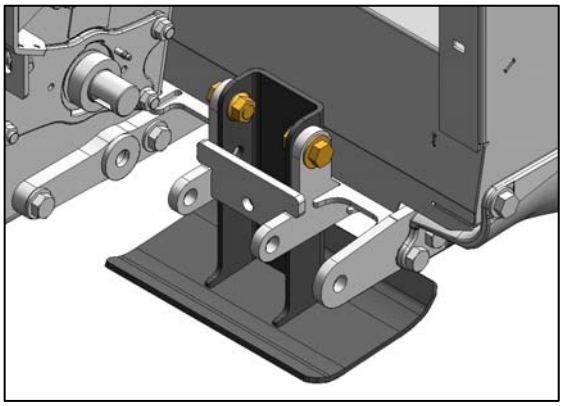


The cutterbar repair tool kit contains the necessary tools for replacement of the cutterbar idler gears. Refer to the Technical Service Manual for instructions.

9.3 DOUBLE WINDROW ATTACHMENT

The double windrow attachment (DWA) can be attached to the M Series Windrower to enable double windrowing. The kit includes all the necessary fittings and instructions.

9.4 SKID SHOE KIT



The skid shoe kit installs at either end of the cutterbar. The shoes can be adjusted for varying cutting height. The kit includes two skid shoe assemblies, attachment hardware, and installation instructions.

10 UNLOADING AND ASSEMBLY

Refer to R85 Rotary Disc Self-Propelled Windrower Header Unloading and Assembly Instructions (Form 169487), and the yellow “Pre-Delivery Checklist” that were included with your shipment.

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